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ABSTRACT

The National Center for Education Statistics gathers and produces statistics and other information on the status and progress of education in the United States. In 1988, the center published the indicators in three volumes, the first two on "The Condition of Education" at the elementary and secondary level and at the postsecondary level, respectively. This third volume includes the indicators from both of the earlier volumes, along with all the technical supporting data, supplemental information, and data sources. For elementary and secondary education, data are presented from the most recent (1986) administration of the National Assessment of Educational Progress (NAEP). These include indicators for student performance; high school completion; fiscal and human resources; student characteristics; learning environment; perceptions of students, staff, and public; and graduation requirements. The section on postsecondary education includes indicators for student performance, degrees conferred, degrees and fields of study categorized by race and ethnicity, fiscal resources and allocations, and student characteristics. Appended are tables and supplementary notes keyed by number to the indicators, a list of data sources, a glossary, and an index. (TE)

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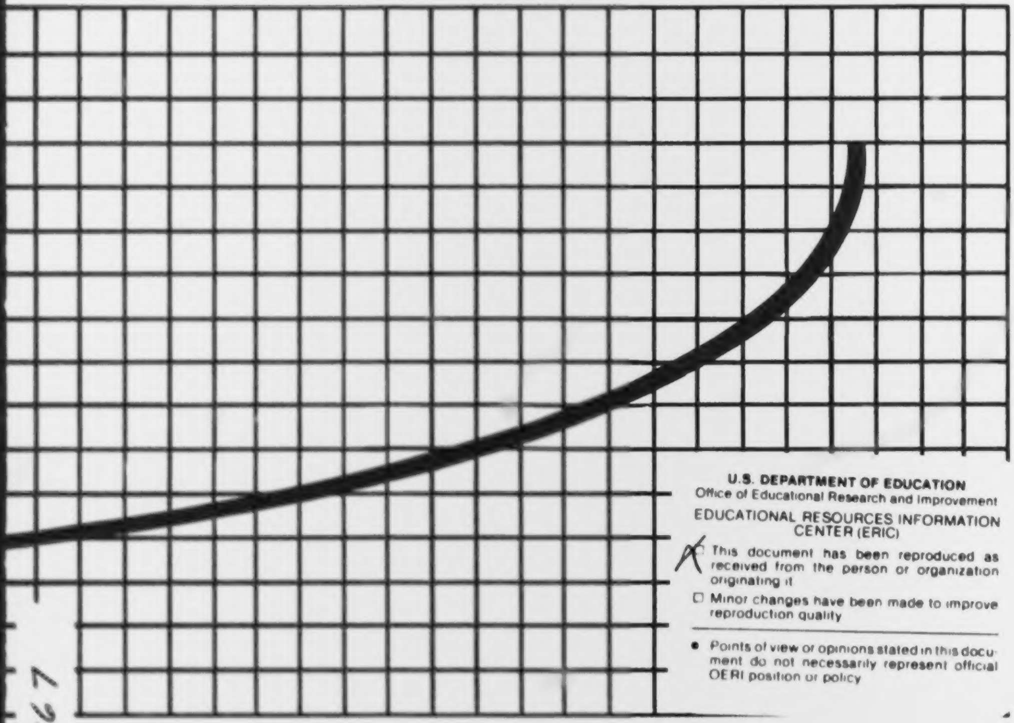
NATIONAL CENTER FOR EDUCATION STATISTICS

1988
EDUCATION INDICATORS



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1988
Education Indicators

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"The purpose of the Center shall be to collect, and analyze, and disseminate statistics and other data related to education in the United States and in other nations."—Section 406(b) of the General Education Provisions Act, as amended (20 U.S.C. 1221e–1).

September 1988

NOTE: The Center has undergone several name changes in the last 3 years—from National Center for Education Statistics (NCES) to Center for Statistics (CS) to Center for Education Statistics (CES). Recent legislation has restored our original name. Source references in this edition sometimes refer to specific publications published under one or another of the Center's various rubrics. We hope this practice does not confuse the reader, and we expect to make our references uniform in future editions.

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Commissioner's Statement

The National Center for Education Statistics gathers and publishes statistics and other information on the status and progress of education in the United States. The Federal authorization for these activities (first enacted in 1867) states that the Center will "collect, collate, and from time to time, report full and complete statistics on the conditions of education in the United States." A later provision (sec. 406 (d)(1)(C) of the General Education Provisions Act) mandated an annual statistical report from the Secretary of Education on the subject. *The Condition of Education 1988* report is the 14th under that mandate. *1988 Education Indicators* is the companion piece to that report.

In the past, the data in these reports were organized into chapters dealing with broad topics in education and featured over 100 charts, together with extensive tabular material. To present the current status of education in a more succinct and accessible way, we began with the 1986 edition of *The Condition of Education* to present selected statistical information in the form of education "indicators"—key data that measure the "health" of education or its trends. These indicators derive from studies carried out by the Center as well as from surveys conducted elsewhere, both within and outside of the Federal Government. The data are the most current, valid, and representative education statistics available in America today for the subjects and issues with which they deal. No more than 40–50 indicators will be presented in a given year.

This year, the Center has chosen to publish the indicators in three volumes. *The Condition of Education* report encompasses the first two volumes, one addressing elementary and secondary education and one on postsecondary education. *1988 Education Indicators* includes the indicators from both of these volumes, plus all the technical supporting data, supplemental information, and data sources.*

For elementary and secondary education, we present data from the most recent (1986) administration of the National Assessment of Educational Progress (NAEP), including indicators on reading skills, knowledge of history and literature, and computer competency. Another NAEP indicator correlates indices of school climate and reading performance. This report also contains analyses of data from the Center's most recent public and private school surveys. From the new National Survey of Science and Mathematics Education conducted by the National Science Foundation, information has been compiled on the difficulty of hiring fully qualified high school teachers, as well as on the availability of advanced mathematics and science courses in high school.

For postsecondary education, we are presenting for the first time as indicators statistics on degrees earned by foreign students; degrees earned by race and ethnicity; field of study by race/ethnicity; expenditures on research and development in higher education institutions; the allocation of expenditures and tuition; and trends in college faculty salaries. Moreover, the report contains measures of literacy among college students and graduates derived from NAEP. Indicators that use data from the most recent administration of the Higher Education General Information Survey (HEGIS) are also included.

Despite all the new material, however, our goal has not been to develop ever more indicators. Rather, the purpose is to identify a basic set of indicators that can be repeated with updated information each year. These basic indicators would be supplemented annually by indicators based on infrequent or one-time studies. Most indicators in the elementary and secondary education section derive from comprehensive time series and thus have appeared in one form or another in previous reports. By contrast, the basic set of postsecondary indicators is still under development, though this report considerably expands the breadth of postsecondary information covered for that sector.

In future editions, the utility of this report should increase as more diverse data of high quality become available, especially as new time series can be constructed. We have already developed an expanded and more valid data base for elementary and secondary education. This major new national and State level education data collection effort, the Schools and Staffing Survey (SASS), is now underway. Future reports will present results from SASS, including comparisons between public and private schools in a number of areas.

Concurrently, the Center is also revising basic data collections on the universe of public schools in the Common Core of Data. Data collections will be more complete and more timely. The Center also has initiated a new longitudinal study of eighth graders—the National Education Longitudinal Study of 1988—that will provide data on the effects of both public and private high schools.

The Center is now planning a second iteration of the National Postsecondary Student Aid Survey to be fielded in 1990. Data from the first cycle (1987) will be available in 1989. Data collection is already underway from more higher education institutions than the traditional 2- and 4-year colleges and universities. This expanded survey is called the Integrated Postsecondary Education Data System (IPEDS). Information from this broader group of institutions will give the education community a clearer picture of what is happening in postsecondary education. Data from IPEDS will be available for the first time in reports to be issued by the Center this year.

In developing indicators, the Center has participated in a widening national discussion about the types of measures that are useful in monitoring the progress of education. A number of local education agencies and States, such as California and Connecticut, are monitoring their reform agendas through education indicators. At the national level, the Council of Chief State School Officers (CCSSO) seeks to have consistent reporting by the States on a number of indicators that CCSSO has identified. The National Science Foundation (NSF) introduced education indicators on science and mathematics in the 1985 edition of its biennial report, *Science Indicators*, and in 1987 published a major report entitled *Indicator Systems for Monitoring Mathematics and Science Education*. The guidance in that report, both on suggested theoretical models and on the content of recommended indicators, is applicable to education indicators in areas other than precollege mathematics and science. That publication was followed by further analyses from the National Academy of Sciences in a 1988 report entitled *Improving Indicators of the Quality of Science and Mathematics Education in Grades K–12*.

The Center also has convened its own meetings of researchers and practitioners to guide its efforts. The final selection of indicators presented in this volume has been based on substantial advice and consultation. They represent, therefore, a professional judgment as to what are the most critical measures of the "health" of education, tempered by the sometimes harsh limitations of available data.

Finally, the format of *Indicators* is designed to present statistical information in an accessible manner for a general audience. Last year we took steps to obtain advice on structure and format from researchers and practitioners in education throughout the country. Their advice is reflected in the layout and charts on these pages. Specifically, we have adopted a more journalistic style in the narratives and have placed the tables supporting each indicator chart in the appendix.

I hope you find the material helpful and invite you to send us comments on how to make future editions even more useful.

Emerson J. Elliott
Acting Commissioner

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*Comparisons cited in the text based upon sample data are statistically significant at the 0.05 level of significance, unless otherwise stated. This report also contains standard error tables for sample data.

Acknowledgments

1988 Education Indicators was prepared in the National Center for Education Statistics (NCES), Office of Educational Research and Improvement (OERI), by the Condition of Education Division under the general supervision of Paul R. Hall, division director.

Joyce D. Stern, the division's Team Leader for Indicator Development, directed the development and production of this edition. Marjorie O. Chandler, head of the Education and Employment Team, provided assistance throughout. Mary Frase was consulted for technical guidance.

The following Condition of Education Division staff played important roles in producing indicators for this edition: Sharon A. Bobbitt derived original new indicators from the National Science Foundation's National Survey of Science and Mathematics Education and from the Metropolitan Life Survey of the American Teacher. She also updated and redrafted the bulk of the elementary and secondary education indicators continued from last year. In addition, Dr. Bobbitt provided computer expertise in transferring the manuscript on disk to the printing contractor and in designing many original indicator charts.

From National Assessment of Educational Progress (NAEP) data, Audrey Pendleton prepared the drafts of the new elementary and secondary education indicators on history and literature test performance, and on reading scores. The latter included an original analysis correlating school climate and NAEP reading performance. She also drafted the postsecondary indicator on literacy among college students and graduates. Joyce Stern prepared the NAEP computer indicator and the new indicator on school discipline problems. Lisa Avallone developed the indicator on enrollment in special education programs.

Gayle Thompson Rogers developed and produced all but one of the new indicators in postsecondary education. These cover spending on research and development in institutions in higher education, earnings of young adults by educational attainment, U.S. degrees earned by foreign students, degrees earned and field of study by race/ethnicity, changes in per student expenditures and tuition levels, and trends in faculty salaries. Clifford Adelman of the Office of Research in OERI designed and drafted the indicator on Graduate Record Examination scores. Curtis Baker updated and redrafted the remaining postsecondary education indicators and several elementary and secondary indicators. Jan Ancarrow assisted in the research on several new elementary/secondary indicators. Debra Gerald and Paul Horn provided projection data. Thomas Snyder provided updated information for most of the continuing indicators. Brenda M. Wade typed most of the supporting tables and other extensive portions of the manuscript, as well as providing substantial general secretarial support services. Carmelita Stevenson also provided typing assistance.

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NOTE: These acknowledgments recognize those who developed new indicators for this report and who updated indicators repeated from the 1986 and 1987 editions of *The Condition of Education*. Mention is not made of those who contributed to the initial development of continuing indicators and who were identified in those editions of *The Condition*.

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Overview

Introduction

The education scene today may be characterized by its dynamism and ferment. Since the early 1980s, the country has become increasingly aware of the range of critical issues facing its schools. They are nationwide in scope and include problems of declining academic performance, concerns about teacher qualifications and availability, reports of drugs and violence in the schools, and observations of declining involvement of parents in the education of their children. These issues have serious implications, not only for the effective operation of the schools, but for future individual employment and U.S. economic competitiveness, and ultimately for the kind of society that is emerging.

The Nation has responded to this situation by renewing its commitment to excellence. The extent of this commitment constitutes a major reform movement in education, one involving government at all levels, school officials and teachers, institutions of higher education, as well as interested laymen. Reforms include expanded academic programs for students, efforts to improve the safety of the schools, increased requirements for high school graduation, and new approaches to attract better-qualified individuals into the teaching profession.

The indicators presented in this section touch on many of issues in elementary and secondary education today. They are discussed below under five major headings: (1) school enrollment; (2) support; (3) the teaching profession; (4) school environment; and (5) outcomes of schooling.

School Enrollment

The basic component of any school system is student enrollment. It generates the need for instructional programs, teachers, administrators, and buildings. Forecasts of future enrollments are essential for decisions pertaining to budgeting and overall policy. The "baby boom echo" that caused elementary school enrollment to rise in 1985 is projected to continue rising through the mid-1990s. The number of these students is expected to go from 28 million in 1987 to 30.8 million by 1997. Secondary school enrollment will continue to decline for several more years. The number of secondary school students will drop to 11.4 million by 1990, when it will then begin to rise. It will reach 13 million by 1997 (indicator *1:17*).

Freedom of choice in educating one's children is a tradition dating back to this country's colonial period. In the fall of 1986, private school was an alternative selected by the parents of some 4.8 million students in kindergarten through 12th grade. Enrollment of private school children as a proportion of total student enrollment has been generally stable at about 10 percent since 1970 (*Indicator 1:16*).

In addition to taking into account aggregate demographic information, schools must plan for different types of students. One such group is the population requiring special education (*Indicator 1:18*). Since 1979, the number of children identified under the Education for All Handicapped Children Act (P.L. 94-142) as requiring special education has risen from 3.9 million to 4.4 million in 1986. The increase has been due primarily to the number of students categorized as learning disabled.

Support for Public Schools

Expenditures and Revenues: Schools require financial resources to pay for programs, staff, and facilities. Indicators that describe support for schools can be portrayed in several ways. Virtually all available measures display phenomenal growth in financial resources directed to public schools. For example, average expenditures per pupil (current and total) have grown dramatically between school years 1949–50 and 1985–86. When adjusted for inflation, current expenditures per pupil more than tripled in that time period (*Indicator 1:8*).

Another way to calculate the proportion of fiscal resources directed to the public schools is to create a composite index to account for a range of factors. One such measure (*Indicator 1:10*) examines the proportion of personal income directed to the public schools and takes into account the relative size of the school-age population. As computed this way, support for public education is also shown to have risen substantially over the years.

An interesting perspective on finances is provided by examining trends in public school revenues derived from the different jurisdictional levels—Federal, State, and local (*Indicator 1:9*). A pattern has emerged that reflects changing perceptions of role and the changing ability of different levels of government to raise funds for education. While from 1920 to 1974 local governments provided the bulk of all revenues for public schools, over that period the proportion of this local support dropped by nearly half. It now stands at an estimated 44 percent of all public school revenues. At the same time, the State share rose fairly steadily, going from just 16.5 percent in 1920 to an estimated 50 percent in 1987. The Federal share has historically been small, never more than 10 percent. In school year 1986–87 it was about 6 percent.

As States and localities have moved to fund reform initiatives, there has been a continuing interest in the link between greater financial investment and increased student performance. However, research on this association is inconclusive; particularly lacking is knowledge of how more effective schools target their funds.

Public Opinion: The investment in public education is ultimately determined by taxpayers who register their interests and concerns at the ballot box, whether for school board members or for local, State, and national political figures. As the resource indicators in this volume show, the American people have provided increased financial support for the public schools. Citizens are now registering a rising confidence in them. For example, in 1987, respondents gave local public schools a higher grade than they had given in the decade since the Gallup organization began asking the public to grade the schools (indicator *1:23*). Nevertheless, this grade (a C+) remains undistinguished.

The Teaching Profession

Staff: School enrollment trends help drive budget allocations, including the decision to hire additional teachers. Another major factor affecting *new hiring* is, of course, staff turnover, i.e., the need to replace teachers who have retired or taken other jobs. Projecting this need into the 1990s (Indicator *1:14*) is useful to school officials who must plan recruitment efforts and to policymakers debating ways to make the profession more attractive to prospective teachers. It is estimated that the annual need for *new hiring* will go from 128,000 teachers next fall to 174,000 in 1995 before leveling off. The rate of growth in the demand for new hires at the secondary level will outpace that at the earlier grades. However, the total number of new hires at the elementary school level will remain substantially greater than at the secondary level throughout the period.

The number of students a teacher is expected to teach also affects expenditures and hiring. One measure of the relationship between the number of teachers and the number of students is class size, that is, the average number of students a teacher faces in a classroom. Another measure is pupil/teacher ratio. In this second measure, all full-time teachers are counted, including those such as art and music teachers who do not have regular classroom assignments (indicator *1:13*). Data show that pupil/teacher ratios in public and private schools are similar. In both sectors, elementary schools had considerably higher ratios than secondary schools, and larger schools enrolled more students per teacher. Other data collected using different methodologies show that there has been a long-term trend to fewer students per teacher.

In addition to variations in the type and number of students enrolled, other factors such as legislative mandates for special programs, reporting requirements, and policy changes may affect the type of staff hired by the public schools. For example, since 1959-60, the number of staff employed in public schools more than doubled—from about 2 million to a little over 4 million. The hiring of more administrative and support staff during the period has translated into a lower proportion of teachers to total staff—down from 65 percent to 53 percent (*Indicator 1:11*).

Salaries: The largest single expense for schools is teacher salaries In recent years, some have argued that to improve the quality of the teaching force, teacher salaries must rise. This view has resulted in a marked increase of 18 percent in the real value of teacher salaries nationally since school year 1980-81. After a decline during the 1970s, the purchasing power of teacher salaries rebounded in 1987 to the level of the early 1970s (*Indicator 1:12*).

Quality: Increasing teachers' salaries is but one perceived way to achieve the goal of improving teacher quality. As another measure, most States are now in the process of requiring that teachers pass a competency test as a prerequisite for certification (*Indicator 1:26*). At the National level, the Carnegie Forum on Education and the Economy has proposed the development of standards covering subject matter, education courses, and teaching performance.[1] Affecting this area will be on-going research at teacher training institutions and debate by policymakers on what teachers should know and be able to do. States and localities also are experimenting with a variety of career roles and responsibilities for teachers, as well as with alternative certification requirements. Under the latter programs, States authorize schools to employ as teachers noncertified individuals with at least a bachelor's degree and concurrently offer special training leading to eligibility for a standard teacher credential.[2] The purpose of all these measures is to enhance the general professionalism of the field and thereby attract and retain higher quality personnel. As these approaches are refined and gain wider acceptance, new and more sophisticated indices on teachers should emerge.

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[1] Carnegie Forum on Education and the Economy, *A Nation Prepared*, 1986.

[2] Nancy E. Adelman, *An Exploratory Study of Teacher Alternative Certification and Retraining Programs*, U.S. Department of Education (Washington, D.C.: 1986).

Additional teachers may be needed in the next decade because of departing teachers and expanding enrollments. Responding to this need could undermine efforts to improve the quality of the teaching force. Shortages already identified in some parts of the country and in some fields could become more widespread. For example, some principals reported their schools had difficulty hiring fully qualified teachers in school year 1985-86 (*Indicator 1:15*). Problems were particularly acute in rural schools and small schools, and for the fields of science and foreign languages. Such findings are important to policymakers and school officials designing teaching incentives, to those setting salary scales, and to officials responsible for training teachers. They also may help college students decide on a course of study or career plan.

The School Environment

School Setting: The dynamic of schooling is affected by more than either fiscal allocations or the teaching force. Safety in the schools and the general school climate can profoundly affect conditions for learning. These areas have been given considerable attention in recent years. Concerns have been voiced about the levels of disruption by misbehaving students, the incidence of crime on or near the school grounds, and the availability of drugs. There also has been research evidence documenting the common sense notion that certain positive environmental characteristics of an educational institution correlate with improved student academic performance.

In one survey of student conduct in 1987, public school teachers reported a substantial increase in disruptive behavior by students over the last 5 years (*Indicator 1:19*). At the same time, teachers indicated that school policies for dealing with problems of student behavior have much improved since 1980. However, only half felt policies in their schools were applied consistently.

Another problem, which many feel threatens the well-being of American society, is drug and alcohol abuse. Indeed, a 1987 survey of U.S. high school seniors indicated that despite modest declines in recent years, the use of drugs and alcohol remains widespread among young adults in this country (*Indicator 1:20*). For example, over half of high school seniors reported they had tried an illegal substance at some point in their lives, while 9 out of 10 reported using alcohol. These substances alter the ability to think and to learn. The survey reveals that they are affecting very large numbers of students.

Research on effective schools suggests that schools with positive climates promote student academic achievement. While the details of what constitutes a positive climate vary from study to study, there is some agreement. One component frequently identified is a safe, orderly environment. Consistent with this thesis is the finding that students from schools whose principals reported numerous problems (such as absenteeism and vandalism) had lower reading scores than students from schools where such problems were not as prevalent (*Indicator 1:21*). This finding has implications for school policy by demonstrating once again that school climate is associated with learning.

Problems such as poor academic performance and disruptive behavior have a variety of causes. How these problems are addressed in the schools may be determined in part by an assessment of the causes. Shedding some light on this situation is *Indicator 1:22*, which portrays the perceptions of teachers and parents. Over half of the teachers surveyed thought the major reason students have difficulty in school is because too many children are left alone after school. In addition, over 80 percent of the teachers said that having parents spend more time with their children would "help a lot" to improve education. Of all possible choices, this home-based remedy got the largest support from the teachers. The most popular remedy with parents (88 percent) was that the school notify parents immediately about problems involving their child. Having parents limit television until all homework was finished was the second most popular choice of both parents and teachers.

Graduation Requirements/Course Availability: One criticism of the schools in the early years of the current reform movement was that their expectations for students' academic performance had become too low. The National Commission on Excellence in Education, for example, charged in 1983 that the high school curriculum had become "diluted and diffuse." One major response by the States and individual school districts to that criticism was to increase the graduation requirements for high school students. Between 1980 and 1986, 39 States increased these requirements.

Graduation requirements in public and private high schools are contrasted in *Indicator 1:24*. By the mid-1980s, both types of schools approximated the 4-year requirement for English and the 3-year requirement for social studies that were recommended by the Commission, but public school requirements in mathematics and science remained considerably lower than either private school requirements or the 3 years for each subject recommended by the Commission.

While requirements are a major factor in determining what courses high school students take, an important constraint is whether courses are offered. During school year 1985-86, most schools, regardless of size, offered biology courses, but chemistry and physics courses were considerably less likely to be offered in small high schools (fewer than 800 students) than in medium or large schools. Calculus, considered essential preparation for science and mathematics study at the college level, was not widely available; only about 30 percent of all high schools offered it (*Indicator 1:25*). These findings have long-term implications for an adequately trained scientific workforce and for this country's ability to compete successfully in the international arena with other developed and technically sophisticated countries.

Outcomes of Schooling

America's citizens naturally hope that the investment they make in educating American children will yield successive generations of individuals who can lead productive lives and contribute to society. Measures of the long-term results remain inadequate, but steps have been taken in recent years at least to document students' knowledge and skills. Equipped with such information, teachers, administrators, parents, policymakers, and legislators may assess the efforts put into education and determine if changes are needed.

The Congressionally mandated National Assessment of Educational Progress (NAEP) periodically tests nationally representative samples of students in key subject and skill areas. The results of recent tests in reading, mathematics, history and literature, and computer skills demonstrate, without exception, the need for considerable improvement by American students at all grade levels in a range of academic skills and disciplines.

Reading skills are considered basic to the education process. In assessing reading achievement in school year 1985-86, NAEP asked students to read prose passages and answer questions about them. *Indicator 1:1* compares the average reading performance of white, black, and Hispanic students in grades 3, 7, and 11. It shows that black and Hispanic students performed below white students at all grade levels. All students had difficulty in tasks requiring them to write and defend or elaborate upon what they had read.

Trend information is available on the performance of 9-, 13-, and 17-year-olds on

NAEP mathematics tests administered in 1973, 1978, 1982, and 1986 (*Indicator 1:2*). In 1986, 9-year-olds showed significant improvement. Seventeen-year-olds also improved. They scored higher in 1986 than their counterparts in both 1978 and 1982, but their scores were lower than the estimated levels of 1973. Despite improvements noted, scores remain low. For example, few older students scored at the upper end of the scale, which required the ability to do multistep problem solving and algebra.

In 1985-86, NAEP tests in both history and literature were administered to high school juniors (*Indicator 1:3*). While over 80 percent of the students responded correctly to questions involving pioneers in technology, slavery, the Bill of Rights, Shakespeare, and the Bible, less than 30 percent correctly answered questions dealing with recent history and modern works of literature.

In 1985-86, for the first time ever, NAEP assessed computer competence of students. Questions covered computer technology, computer applications (such as word processing and graphics), and computer programming. Students answered fewer than half the questions correctly; even the average of those who had a computer at home and who studied computers in school was below 50 percent correct (*Indicator 1:4*). With the increasing shift to a computer-based technology in work places throughout the world, these findings are of interest to education policymakers and school officials alike.

NAEP data are valuable benchmarks in assessing student performance. However, NAEP does have its limitations: sampling is currently inadequate for State-by-State comparisons; knowledge of particular subjects (e.g., science and writing) has been assessed infrequently; and the subjects students take are not ascertained. These problems are well known. As steps are being taken to address them, future indicators based on NAEP will grow in significance.[3]

Another source of information about learning outcomes is college admissions tests (*Indicator 1:5*). Either the Scholastic Aptitude Test (SAT) or the test developed by the American College Testing program (ACT) is generally taken as part of the college application process. Total SAT scores (verbal and mathematics tests combined) have held steady since 1985, when declining scores rebounded to their 1975 level of 906. However, they remain well below the 1963 score of 980 just before the period of steady decline began. Composite ACT scores have varied only slightly since 1974. Mathematics and social studies scores have not changed appreciably in the last 12 years, but fall well below the highs of 1970. The average scores on the English and natural sciences tests have varied only slightly since 1970.

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[3] For a discussion of recommended changes in future NAEP assessments, see National Academy of Education, *The Nation's Report Card: Improving the Assessement of Student Achievement*, (Cambridge, MA: 1987).

SAT and ACT scores are indeed popular measures of student outcomes, but they have certain limitations as indicators of performance. For example, they are not taken by a representative sample of older secondary school-age youth, but only by college-bound students who elect to take them. Moreover, the proportion of students who take the tests varies widely among the States. Finally, whether these tests measure aptitude, achievement, or both is a matter of ongoing debate.

In discussing the availability of courses earlier, it was noted that some schools have limited offerings, particularly in certain science and mathematics courses. *Indicator 1:6* shows the possible consequences of such curriculum shortcomings. In correlating ACT scores with the number and sophistication of courses taken, test scores were generally higher when more courses had been studied. Mathematics is learned primarily in school. Thus it is especially critical to have courses offered. Students who lack the opportunity to learn are undoubtedly hampered in their ability to score well on the pre-college tests and may well be at a disadvantage in college.

Another outcome indicator addresses the success of schools in retaining students to graduation. Although firm data on dropouts are not available, there is trend information on the proportion of students who have completed high school (*Indicator 1:7*). Nationally, in 1986 almost three out of four 18- and 19-year-olds had done so. For 20- to 24-year-olds, the proportion was higher—nearly 85 percent. For the younger students, completion rates were considerably lower for blacks and Hispanics than for whites. However, completion rates for black youth aged 20 to 24 have improved since 1980 and the gap between them and their white counterparts has appreciably narrowed. In 1986, 81 percent of the black youth in this age group had a high school or high school equivalency diploma compared to 85 percent of the whites. Rates for Hispanic youth, by contrast, remain low even for this older cohort.

Conclusion

As this report documents, serious problems are confronting the schools in the form of rising enrollments, reported difficulty in hiring teachers, classroom disruption, drug abuse, and, above all, low student performance. Many of these problems are beyond the capacity of the school to solve alone: parents, students themselves, teacher training institutions, and elected officials, and sometimes juvenile authorities and police must share in the responsibility.

But the importance of these problems has been recognized at every level of responsibility throughout the country. Indeed, the reform movement may be characterized by its vitality and the range of actors involved. Paramount among them are the States. Although some States had begun reform initiatives before 1983, the issuance of *A Nation at Risk* that year by the National Commission on Excellence in Education was a major stimulus to action. Education reform soon headed the action agendas of virtually every State.[4]

The role of the States remains strong. For example, the National Governor's Association (NGA) in 1986 launched a 5-year plan to attain certain educational improvements. These include recruiting talented teachers, promoting parent involvement and educational choice, and incorporating the use of technology in the schools. Achieving such goals assumes the commitment of all those involved in teaching and training America's children and youth. Accordingly, the governors are addressing these goals in concert with educators and other citizens.[5]

While education has experienced previous reform eras in our country's history, the current one is noted for popular demands for accountability. Interest in education indicators to document educational changes may be seen as one result of that demand. But the quality and usefulness of education indicators are limited by at least three factors. One is that defining and developing education indicators has only recently been attempted; the first Federal publication on education indicators was issued in 1985. More work on conceptualizing education indicators and indicator systems remains to be done. The second concerns the quality of the data from which education indicators may be derived. Many indicators in this volume are surrogates or place holders awaiting data from improved surveys, in particular those comparing public and private schools and those describing teachers.

The third limitation is derived from the ferment of the reform movement itself. As reforms progress and goals are refined or changed, indicators will have to be modified accordingly. For example, this volume features some reform measures such as requiring students to take more courses and increasing teacher salaries.

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[4] U.S. Department of Education, *The Nation Responds: Recent Efforts to Improve Education*, (Washington, D.C.: 1984).

[5] National Governors' Association, *Time for Results: The Governors' 1991 Report on Education*, (Washington, D.C.: 1986) and *Results in Education: 1987*, (Washington, D.C.: 1987).

But many reforms are too localized or too new to report in a publication on national indicators. If such reforms become more widespread and if they can be linked to improved student performance, they could someday become indicator candidates.

How successfully the Nation combats its educational problems will be assessed in future editions of this report. As the concept of education indicators grows in sophistication and as surveys are better tailored to report on key measures of education, this assessment should become increasingly precise.

A. Outcomes: Student Performance

Indicator 1:1 Reading performance in grades 3, 7, and 11

- **In 1986, average reading proficiency was lower for minority students, disadvantaged urban students, and males than for nonminority students, advantaged urban students, and females at all three grade levels tested nationally.**
- **All students had particular difficulty with tasks that required them to elaborate upon or defend their judgments and interpretations about what they had read.**

Reading skills are considered basic to the education process. So when some students lag in their reading achievement, they may find it hard to participate effectively in an economy requiring increasingly sophisticated job skills.

The National Assessment for Educational Progress (NAEP)* in 1986 tested the reading performance of various groups of students in grades 3, 7, and 11 of public and private schools, and found it to be uneven. Specifically, black and Hispanic students performed at levels below that of white students. NAEP has also found that 11th graders in an academic curriculum had higher reading scores than those in general or vocational programs, and that black—and particularly Hispanic—students were less likely to be in academic programs than white students.

The NAEP results also showed that the type of community in which a student attends school is related to reading performance. Students attending school in advantaged-urban communities had substantially higher reading scores than students attending school in disadvantaged-urban communities.

The assessment also included the opportunity to read, think, and write. Results indicated that, while the Nation's students had the skills to derive a surface understanding of what they had read, they had difficulty when asked to defend or elaborate upon this surface understanding. NAEP evaluated responses according to their complexity. About 80 percent of the third graders wrote "inadequate" or "minimal" responses to the first story task and only 18 percent produced a "satisfactory" response. Although the 11th graders performed with greater success, 36 percent wrote "inadequate" or "minimal" responses, and only 22 percent wrote "elaborated" responses. Results for the other two tasks were similarly poor.

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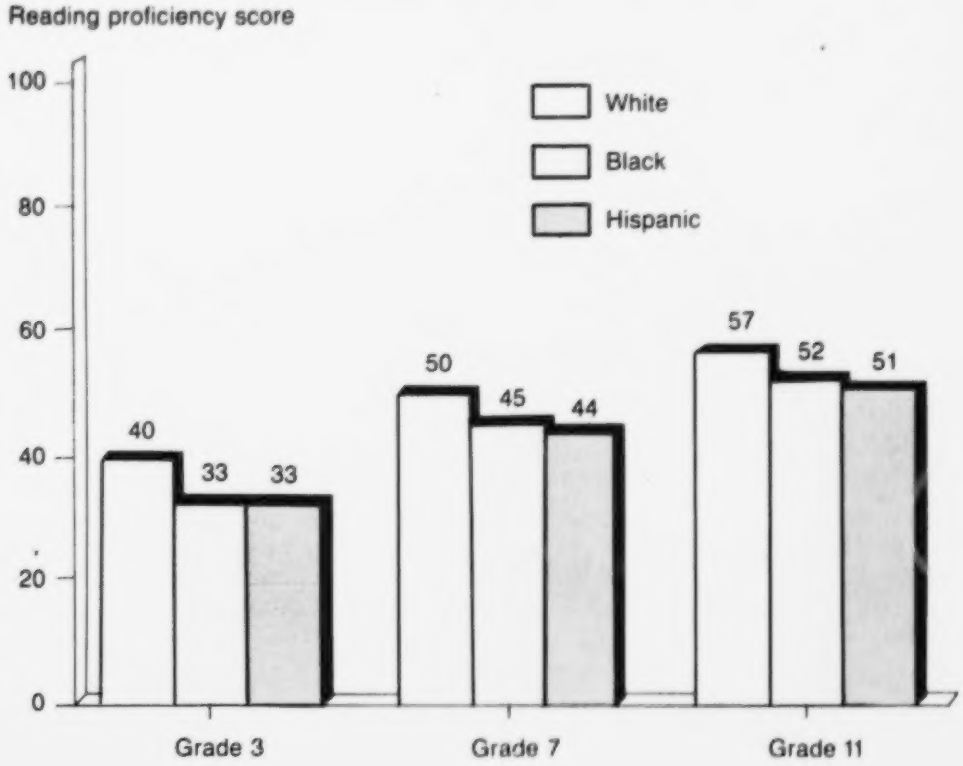
*NAEP is a Congressionally mandated project that has assessed reading achievement five times, most recently in the 1985–86 school year. Because the 1985-86 test was not equivalent to the earlier tests, trend information is not available. With the 1988 assessment, adjustments will be made to the 1985–86 data to allow for comparisons with previous NAEP reading tests.

SOURCE: National Assessment of Educational Progress, *Who Reads Best? Factors Related to Reading Achievement in Grades 3, 7, and 11*, 1988.

Chart 1:1.—Average reading proficiency, by race/ethnicity: 1986



NOTE: The range of the reading proficiency scale was from 0 to 100. The average scores by grade were 38.1 for grade 3, 48.9 for grade 7, and 56.1 for grade 11.

SOURCE: National Assessment of Educational Progress, 1988.

Indicator 1:2 Trends in mathematics performance of 9-, 13-, and 17-year-olds

- **Between 1982 and 1986, 9- and 17-year-olds slightly increased their mathematics performance. Although 13-year-olds improved a bit between 1978 and 1982, their performance leveled off in 1986.**
- **While mathematics performance has improved, it remains low. Improvements occurred at the lower levels of the mathematics proficiency scale; most students, even at age 17, were unable to perform at the upper levels of the scale.**

Declining test scores have been a national concern since the late 1960s, when the National Assessment of Educational Progress (NAEP) began periodically assessing students' knowledge, skills, and attitudes. During a time when science and technology have played an increasingly important role in the Nation's economy and national security—and in the ability of all citizens to function in a high-technology society—mathematics and science achievement scores have declined.

Recent results from the 1986 NAEP Mathematics Assessment show an upturn in the mathematics performance of 9- and 17-year-old students.* At all three ages, improvements occurred in lower-level skills involving routine computations and measurement problems rather than more complex procedures and analytical problem solving.

Average mathematics achievement for all three age groups remains low. One-third of 13-year-olds and one-eighth of 17-year-olds were unable to perform at the level of the mathematics scale that involves the four basic operations (addition, subtraction, multiplication, and division), problem solving, and comparing information from graphs and charts (250 scale level). Only 4 percent of 17-year-olds scored at the level involving multistep problem solving and algebra (350 scale level).

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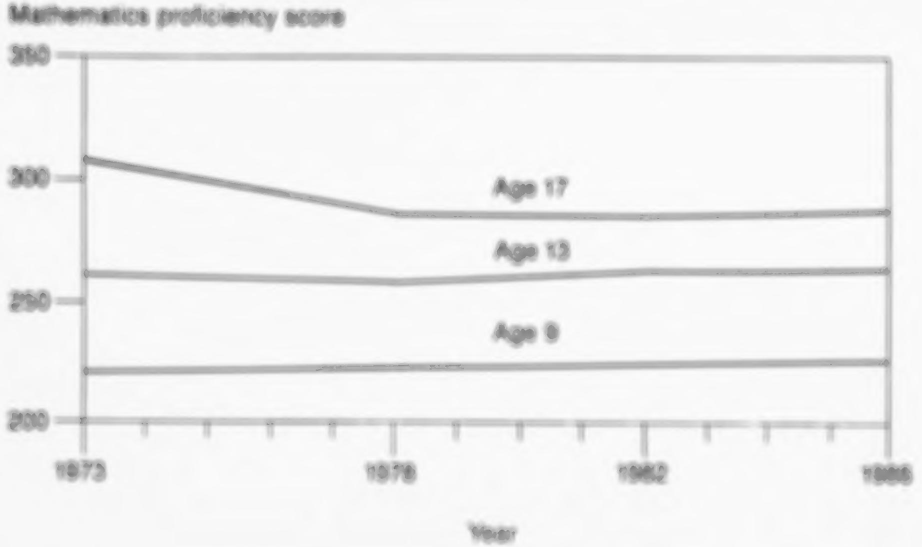
*NAEP has assessed mathematics achievement four times—in 1973, 1978, 1982, and 1986.

SOURCE: National Assessment of Educational Progress, *The Mathematics Report Card: Are We Measuring Up?*, 1988.

Chart 1:2.—Trends in average mathematics proficiency: Selected years, 1973-1986



NOTES:

Mathematics Proficiency Scale
150 = Simple arithmetic facts
200 = Beginning skills and understanding
250 = Basic operations and problem solving
300 = Moderately complex procedures and reasoning
350 = Multistep problem solving and algebra

The 1973 mathematics assessment was not included in the scaling of NAEP trend data. However, a rough estimate of the 1973 mean level of student math proficiency was computed by NAEP.

SOURCE: National Assessment of Educational Progress, 1988.

Indicator 1:3 Knowledge of U.S. history and literature

- **In 1986, 80 percent or more of U.S. 11th graders had some knowledge of such aspects of history as pioneers in technology, colonial history, economic history, geography, World War II, slavery, and the Bill of Rights. Less than 30 percent correctly answered questions dealing with the approximate dates of historical events, recent history, and the women's movement.**
- **In literature, 80 percent or more of 11th graders could answer questions involving the Bible, Shakespeare, black literature, children's classics, and well-known American and English literature. Less than 30 percent identified the American and European authors of certain, mostly modern, literary works.**

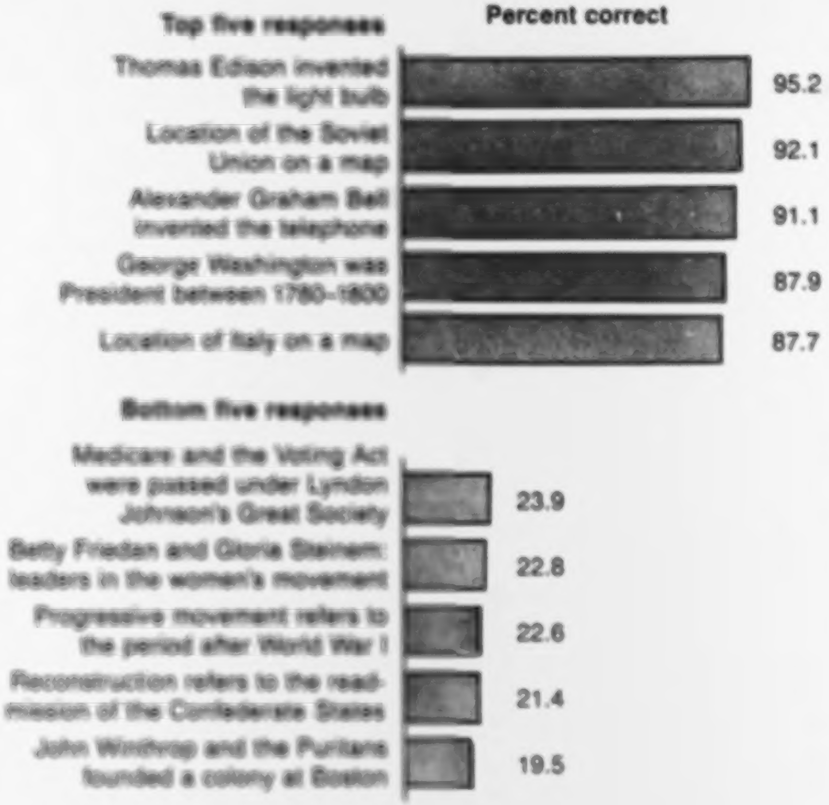
History and literature transmit and enrich our culture and serve as a basis for communication among literate people. The 1986 National Assessment of Educational Progress (NAEP) in literature and U.S. history is the first major survey of students' knowledge of specific factual content.

While no absolute standards exist for judging what all students "should" know, specific items included in the assessment provide us with a profile of student knowledge. In U.S. history, 19 out of 20 high school juniors knew that Thomas Edison invented the light bulb, that Alexander Graham Bell invented the telephone, or where the Soviet Union is on a map. However, fewer than one out of four knew when Abraham Lincoln was president or that Reconstruction refers to the readmission of the Confederate States to the Union. In literature, more than 9 out of 10 knew that Noah gathered pairs of creatures onto an Ark, that Moses led the people out of Egypt and gave the 10 Commandments, and that Romeo and Juliet's love was hindered by their feuding families. But fewer than one out of four knew that Tennessee Williams wrote *A Streetcar Named Desire* or that Alexis de Toqueville wrote about what he saw in *Democracy in America*.

Students enrolled in an academic program performed significantly better than students in either a general program or vocational/technical programs. Initial differences in ability may exist between students in these programs; moreover, students in academic programs spend more time in school studying history and literature.

SOURCE: National Assessment of Educational Progress, *Literature and U.S. History: The Instructional Experience and Factual Knowledge of High School Juniors*, 1987.

Chart 1:3.—U.S. history item responses: 1986



SOURCE: National Assessment of Educational Progress, 1987.

A. Outcomes: Student Performance

Indicator 1:4 Computer competence in grades 3, 7, and 11

- **In a 1985–86 assessment of computer competence, students in each of grades 3, 7, and 11 averaged less than 50 percent correct on the test items.**
- **Even students who had used a computer, studied computers in school, or had one at home generally averaged under 50 percent correct.**

America's prominence in the world economy and its national security have become tied to computer-based technology. In 1983, the National Commission on Excellence in Education in *A Nation at Risk* brought increased attention to computer science by recommending it be required of all high school students as part of the "Five New Basics" along with English, mathematics, science, and social studies.

Recognizing the importance of computer skills for employment opportunities and productivity, administrators of the National Assessment of Educational Progress included an examination of computer competence in selected grades during school year 1985–86. The students' competence was tested in three areas: (a) computer technology, (b) computer applications (e.g., word processing and graphics), and (c) computer programming. Students generally had difficulty answering questions on the assessment. On average, 3rd graders could only answer about 3 out of 10 items correctly; 7th graders, 4 out of 10; and 11th graders, fewer than 5 out of 10.[*] Low scores in using applications and in programming seem to be related to the low frequencies of computer use in most classrooms. For example, about two-thirds of students assessed had never written computer programs.

Students who had access to or training on computers scored higher. Specifically, the experiences of having ever used a computer, studying computers in school, and having access to a computer at home are positively related to computer competence. Nevertheless, even the average performance of advantaged students generally fell below 50 percent. Perhaps the most surprising finding was that improvement in test scores associated with school and home computer use was so small.

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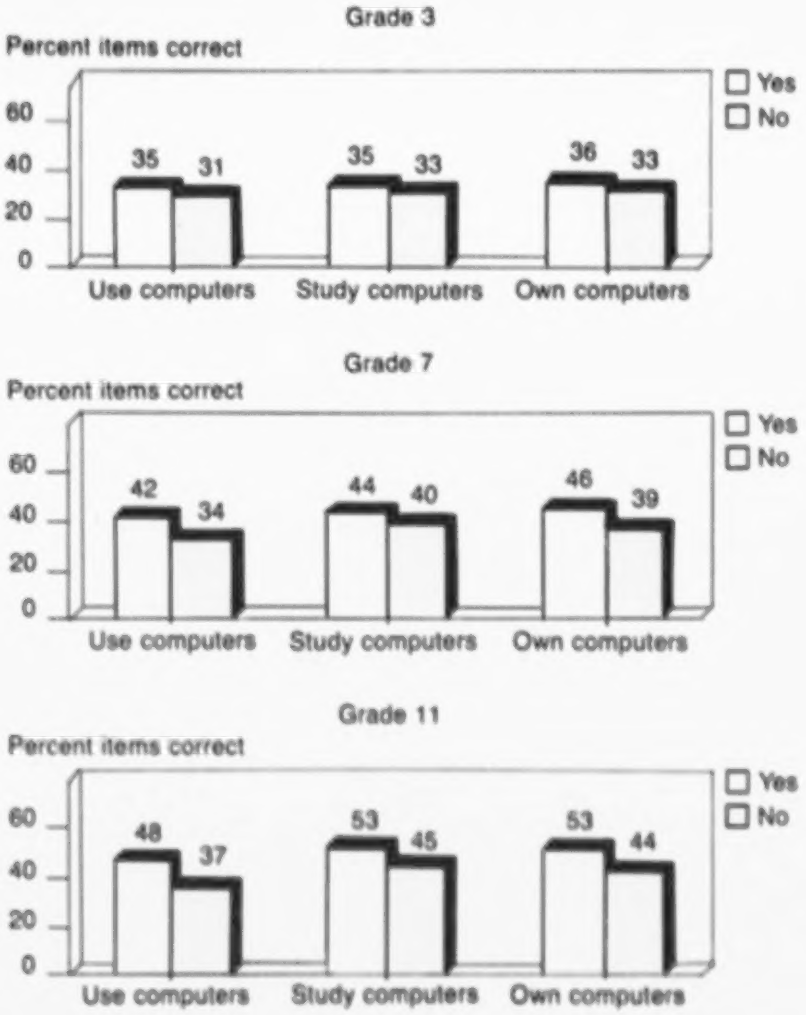
[*] The overall performance index appearing on the chart and corresponding table was derived by computing the mean percent correct for all items at that grade.

Note: Some items in the assessment, but not shown on this graph, were common from grade to grade or across all grades. For these items, performance was higher at the higher grades.

SOURCE: National Assessment of Educational Progress, *Computer Competence: The First National Assessment*, draft final report, November 1987.

Chart 1:4.—Performance on NAEP computer assessment, by grade and computer experience: School year ending 1986



SOURCE: National Assessment of Educational Progress, *Computer Competence: The First National Assessment*, draft final report, November 1987.

Indicator 1:5 College entrance examination scores

- **After years of decline, Scholastic Aptitude Test (SAT) scores began rising in 1982; by 1985, the verbal and mathematics tests combined returned to the 1975 level of 906—still 74 points below their 1963 high. The combined score has not changed since 1985.**
- **American College Testing (ACT) English scores declined until the mid-1970s and mathematics scores declined to a low point in 1983. Both English and mathematics scores have risen since; however, 1987 scores varied only slightly from 1985 and 1986.**
- **Students attending private high schools generally score higher than public school students on the ACT and verbal SAT tests. However, scores on the SAT mathematics tests are similar for both public and private high school students.**

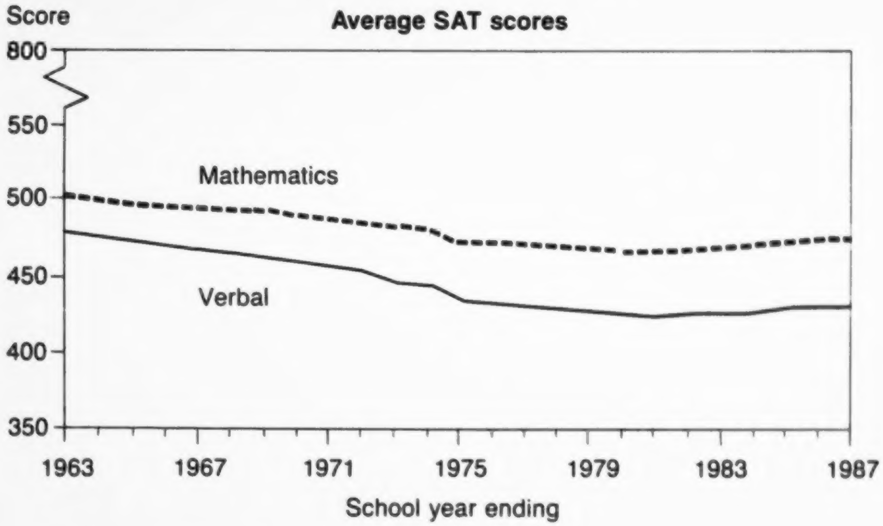
The tests taken most frequently by college-bound students are the Scholastic Aptitude Test (SAT) and the American College Testing Program Assessment (ACT). These tests are designed to predict how well students might perform in college and were not intended as measures of the outcomes of schooling.

College entrance examination test scores declined substantially during the 1960s and 1970s. SAT scores declined 90 points from 1963 to 1980 but in 1982 began to rise. By 1985, the total score for the mathematics and verbal tests combined had risen 16 points to 906, representing a return to 1975 levels. ACT English scores had declined from 18.5 in 1970 to 17.5 in 1976; by 1983, ACT mathematics scores had declined 3.1 points to 16.9. ACT scores rose to 18.5 in English and 17.3 in mathematics in 1986.

Scores on the SAT and ACT are reported separately for public and private high school students. Since 1981, private high school students have generally scored higher than public high school students on the ACT and verbal SAT examinations. In 1987, for example, students attending religiously affiliated private high schools received an average SAT verbal score of 440 and students attending independent private high schools received an average SAT verbal score of 473. Public high school students, however, scored an average of only 428. In mathematics, students in religiously affiliated private high schools received an average SAT score of 469, while those in independent private high schools averaged 519. The average SAT math score for public high school students was 476.

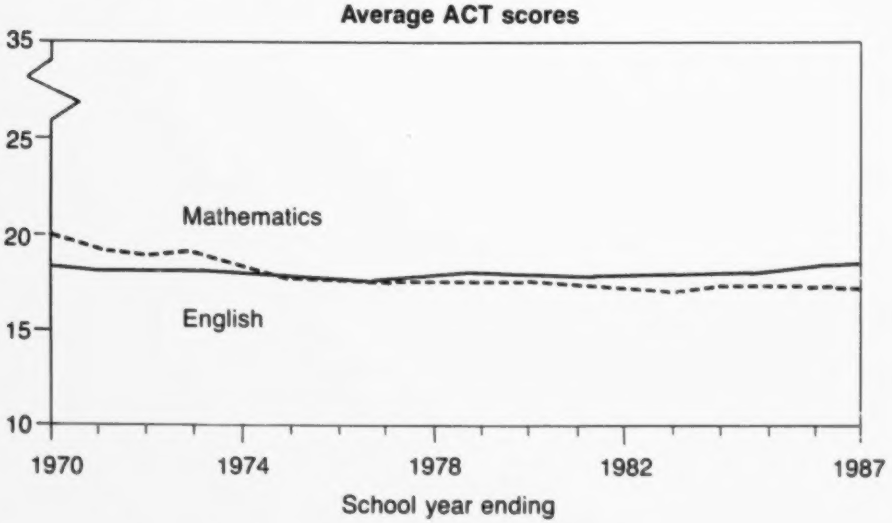
SOURCES: College Entrance Examination Board, *National Report: College-Bound Seniors*, various years. The American College Testing Program, *The High School Profile Report, Normative Data*, various years.

Chart 1:5.—Trends in college entrance examination scores



Average SAT scores

SOURCE: The College Entrance Examination Board.



Average ACT scores

SOURCE: The American College Testing Program.

Indicator 1:6 Academic coursework and achievement

- **Students who take more courses in a subject generally score higher on the American College Testing (ACT) test in that subject than students who take fewer courses.**
- **These increases in average test scores were much larger for mathematics and natural sciences than for English and social studies.**

The 1980s have been a period of renewed concern about the adequacy of academic preparation for postsecondary education and employment. Following publication of *A Nation at Risk,* a number of States passed legislation increasing the required coursework for high school graduation and sometimes for college entrance.[1]

A number of studies have shown that course-taking affects achievement.[2] This connection may be seen in the fall 1985 American College Testing (ACT) Program scores. Students with differing amounts of preparation in four subject areas took the ACT tests in those subjects—English, mathematics, natural science, and social studies. On average, high school seniors who had taken more coursework did score higher on the corresponding test, with the exception of a sixth or seventh course in social studies. Students who ranked higher in their class tended to take more coursework.

Similar results were found in a study of Scholastic Aptitude Test (SAT) examinees. SAT scores were compared for students with differing amounts of coursework in six academic subjects. Both the number of courses taken and the level of the course were related to scores. For example, SAT mathematics scores increased with the level of mathematics course taken. Presumably, students taking higher level courses such as calculus have also taken more courses.

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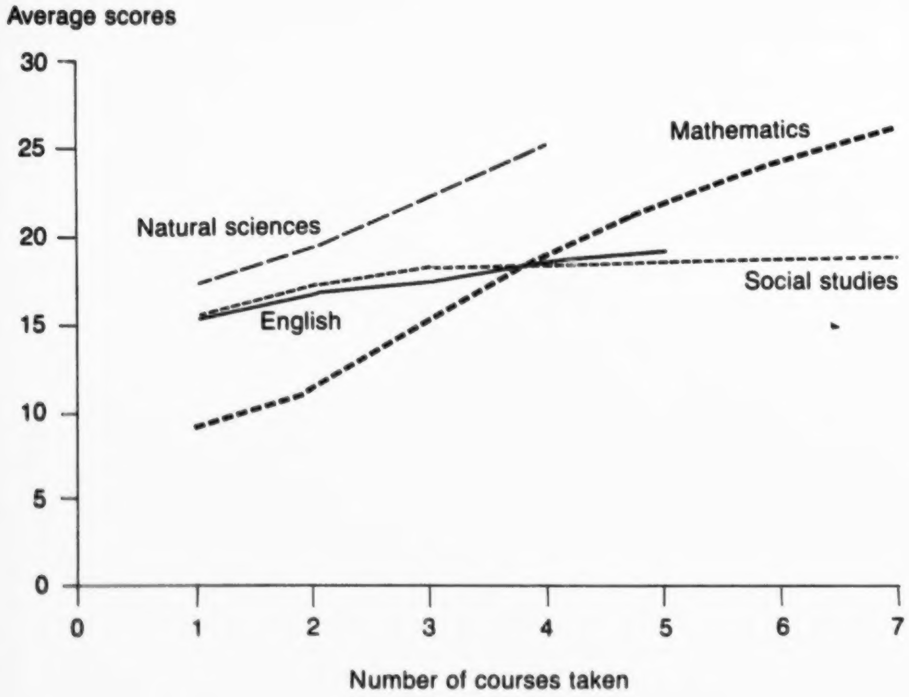
[1] The National Commission on Excellence in Education, *A Nation at Risk: The Imperative for Educational Reform.* (Washington, D.C.: U.S. Department of Education, 1983.)

[2] For example, K. L. Alexander and A. M. Pallas, "Curriculum Reform and School Performance: An Evaluation of the 'New Basics'," *American Journal of Education 92,* (1984): 392–420; W. H. Schmidt, "High School Course-taking: Its Relationship to Achievement," *Journal of Curriculum Studies 15,* (1983): 311–332; and others.

SOURCE: College Entrance Examination Board, *National Report: College-Bound Seniors,* 1987. J. Laing, H. Engen, and J. Maxey, "The Relationship of High School Coursework to the Corresponding ACT Assessment Scores," *ACT Research Report 87-3,* (1987).

Chart 1:6.—Average ACT scores, by number of courses taken in subject: 1985



SOURCE: Laing, Enger, and Maxey, *ACT Research Report 87-3,* 1987.

Indicator 1:7 High school completion, by race and ethnicity

- **Nationally, almost three-quarters of all 18- and 19-year-olds have completed high school.**
- **The proportion of 20- to 24-year-olds who have completed high school has remained around 84 percent since 1974.**
- **The proportion of black youths, aged 18 to 19 and 20 to 24, who have completed high school has increased steadily since 1974. The rates for both black and Hispanic youth still lag far behind those of whites.**

One important measure of this Nation's success in educating its youth is the proportion of its students who complete high school. Those who drop out may not obtain sufficient knowledge and skills to function productively in our society.

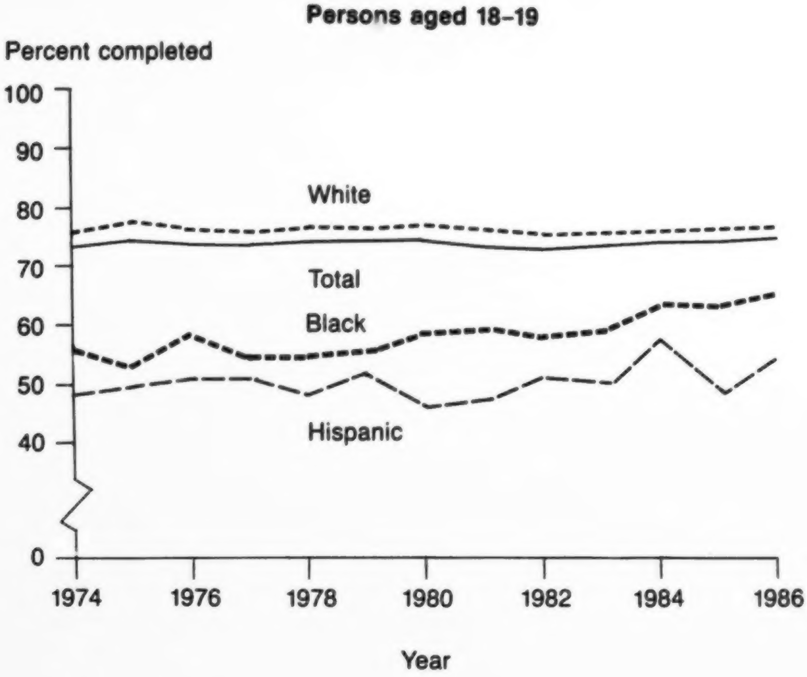
The public generally expects an 18- or 19-year-old to have a high school diploma or its equivalent, and most do. However, black and Hispanic youth lag behind white youth in this attainment. For example, in 1986, 77 percent of white 18- to 19-year-olds completed secondary school, but only 65 percent of black youth and 55 percent of Hispanic youth in this age group did so. However, blacks 20–24 years old are now almost as likely as whites to have completed high school.

Many students take longer to complete their high school education. For example, the percentage of 20- to 24-year-olds who have completed secondary school is about 10 percentage points higher than for 18- to 19-year-olds. For the two age groups, completion rates were:

	Age: 18–19			Age: 20–24		
Year	White	Black	Hispanic	White	Black	Hispanic
	Percent of age group			Percent of age group		
1974	76	56	49	86	72	59
1980	76	59	46	85	74	57
1986	77	65	55	85	81	62

SOURCE: U.S. Department of Commerce, Bureau of the Census, "School Enrollment—Social and Economic Characteristics of Students, October [various years]," *Current Population Reports*, Series P-20; and unpublished tabulations.

Chart 1:7.—Trends in high school completion rates, by race and Hispanic origin: 1974–1986



NOTE: Hispanics may be of any race.

SOURCE: Bureau of the Census, *Current Population Reports*.

Indicator 1:8 Expenditure per pupil in public schools

- **Between the 1949–50 and 1985–86 school years, current expenditure per pupil in constant dollars more than tripled, from $960 to $3,752 per pupil.**
- **Between 1977–78 and 1981–82, current expenditure per pupil in constant dollars remained relatively unchanged, but then began rising.**

One frequently used measure of financial resources available to public schools is per pupil expenditure. This measure is a ratio of average daily attendance and expenditure for education. Data on trends in per pupil expenditure provide valuable information to policymakers at all levels of government on the overall disposition of resources. They do not provide information about individual school district expenditures, the quality or type of resources provided, or their impact on learning.

This indicator examines current and total expenditure per pupil over time. Current expenditure includes expenditure for operating local public schools, including such items as salaries, fixed charges, student transportation, books and materials, and energy costs. Excluded are long-term expenses of capital outlay and interest on school debt, as well as community service. Total expenditure includes current expenditure plus these long-term expenses. Total and current expenditure may be expressed in both current and constant dollars, the latter adjusted for inflation.*

In constant dollars, current expenditure has grown at a faster rate than total expenditure, 291 versus 242 percent between school years 1949–50 and 1985–86, respectively. The growth rate of current expenditure, however, was not uniform. After rising steadily from 1949–50 to 1977–78, per pupil expenditure in constant dollars leveled off and remained relatively unchanged until 1982-83, when it began rising once again. (See *Indicator 1:17* for public school enrollment from 1969).

Trends in current expenditure per pupil vary widely from State to State and may not necessarily reflect national patterns. While current expenditure per pupil in the United States rose almost 60 percent in constant dollars between school years 1969–70 and 1985–86, State-level percentage increases varied during the same period from 155 percent (Alaska) to 33 percent (Utah).

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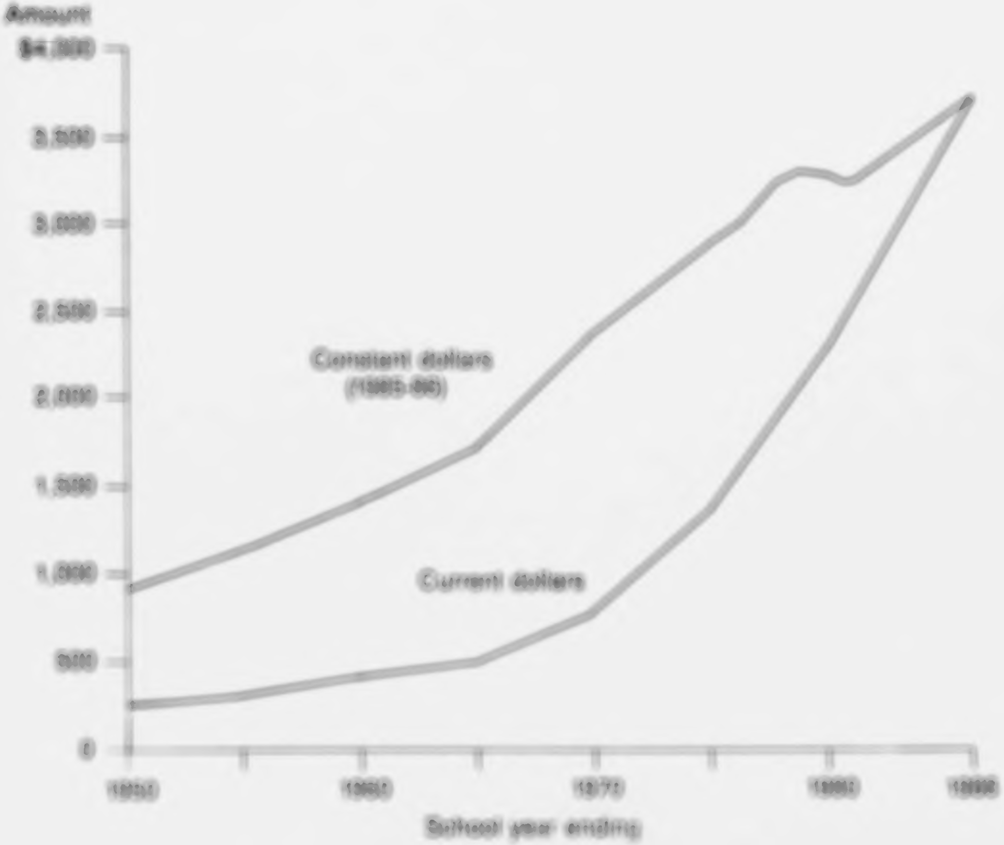
* Based on the Consumer Price Index for urban wage earners, prepared by the Bureau of Labor Statistics, U.S. Department of Labor. Data adjusted from a calendar-year to a school-year basis.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Statistics of State School Systems*, various years; *Revenues and Expenditures for Public Elementary and Secondary Education*, various years; Common Core of Data survey, various years; and unpublished data.

Chart 1:8.—Trends in current expenditure per pupil in average daily attendance in public schools: Selected school years ending 1950-1987



SOURCE: National Center for Education Statistics, *Statistics of State School Systems* and *Revenues and Expenditures for Public Elementary and Secondary Education*; Common Core of Data survey; National Education Association, *Estimates of School Statistics*.

Indicator 1:9 Public school revenues

- **State and local governments have been the primary source of revenues for public elementary and secondary education, while the Federal share has remained small.**
- **In 1979, an historic shift occurred when the States' share of revenues rose above the locals' share for the first time.**
- **Between the 1919–20 and 1986–87 school years, local governments' share of total revenues fell from 83 percent to 44 percent.**

Public schools obtain revenues from three principal sources: local, State and Federal governments. The share that each contributes is determined by many factors, including the perceptions of its role in supporting public education; the extent to which it taxes itself; the size of its tax base; and the competing demands on its tax revenues. Historically, local governments have been limited primarily to property taxes and State grants as a basis for raising funds. In recent years, localities in some States have experienced difficulty in using property taxes for additional funds (e.g., Proposition 13 in California). By comparison, most State governments use both the sales tax and income tax as revenue-raising vehicles.

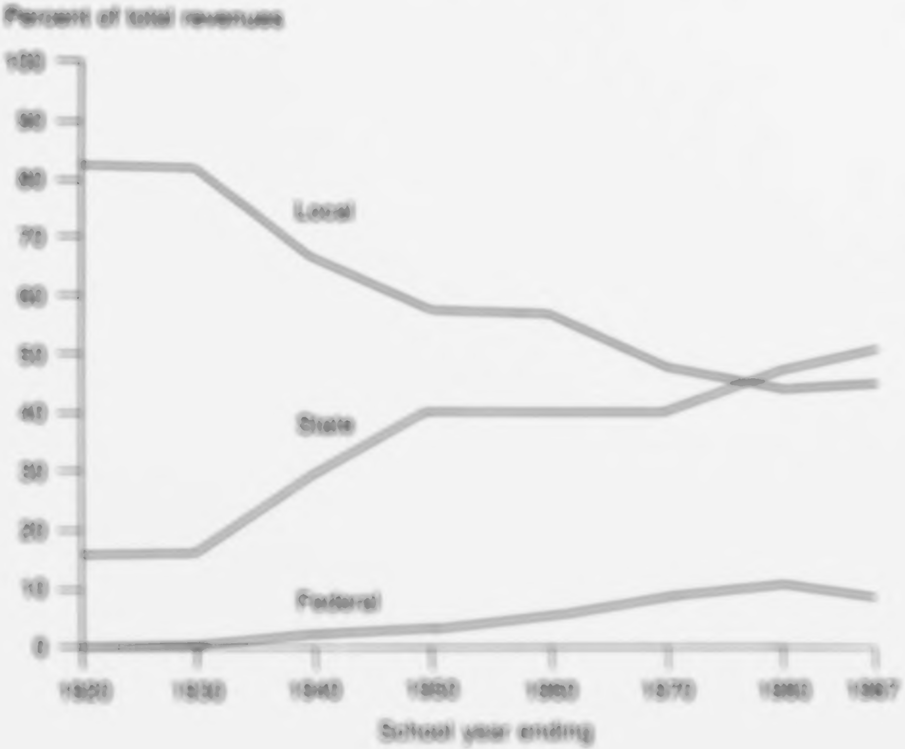
Through at least the 1973–74 school year, local governments provided more than 50 percent of all revenues for local elementary and secondary schools. Reflecting school finance reform efforts, including court cases, by the 1978–79 school year, more funds were provided by State governments than any other source.

Below is a summary of the sources of public school revenues from school years 1959–60 through 1986–87.

School year ending	Percent of revenue from:		
	Local	State	Federal
1960	56	39	4
1970	52	40	8
1980	43	47	10
1987	44	50	6

SOURCES: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1989* (based on Common Core of Data survey and its predecessors); National Education Association, *Estimates of School Statistics, 1986–87*, 1987, copyrighted (all rights reserved).

Chart 1:9.—National trends in revenue sources for public elementary and secondary education: Selected school years ending 1920-1987



SOURCES: National Center for Education Statistics, *Digest of Education Statistics, 1988*; National Education Association, *Estimates of School Statistics, 1986-87*.

Indicator 1:10 National index of public school revenues per pupil in relation to per capita income

- **The national index gauging per pupil revenues as a percentage of per capita income has more than doubled since 1929–30.**

Countries often report the percentage of GNP devoted to education. The national index presented here is a refinement of that figure. The numerator is revenues per pupil, a measure of the resources or services accorded the typical pupil. The denominator becomes income per capita, a measure of the ability to pay of the typical taxpayer.[1] Therefore, the index reflects what the average student receives relative to the typical taxpayer's ability to pay.

Four factors make up this index: 1) the number of pupils enrolled in public schools, 2) public education revenues, 3) total personal income, and 4) the total population. Between school years 1929–30 and 1986–87, the national index more than doubled. This indicates that over twice the funds were available per student in 1986–87 as a percentage of per capita income than in 1929–30. After dropping almost 1 percentage point (to about 26) in 1981–82, the index rebounded to over 27.6 in 1986–87.

Changes over time in the overall index can be due to circumstances affecting any of the four factors. An increase in the index means either that per pupil revenues have grown relative to ability to pay, or that per capita income has declined relative to revenues per pupil. Conversely, a decline in the index demonstrates either that the resources accorded the typical pupil have declined relative to per capita income or that ability to pay has increased relative to per pupil revenues. For example, the index rose between school years 1929–30 and 1939–40 because 1) enrollments slightly decreased, 2) total revenues increased, and 3) total personal income fell, while 4) total population increased.

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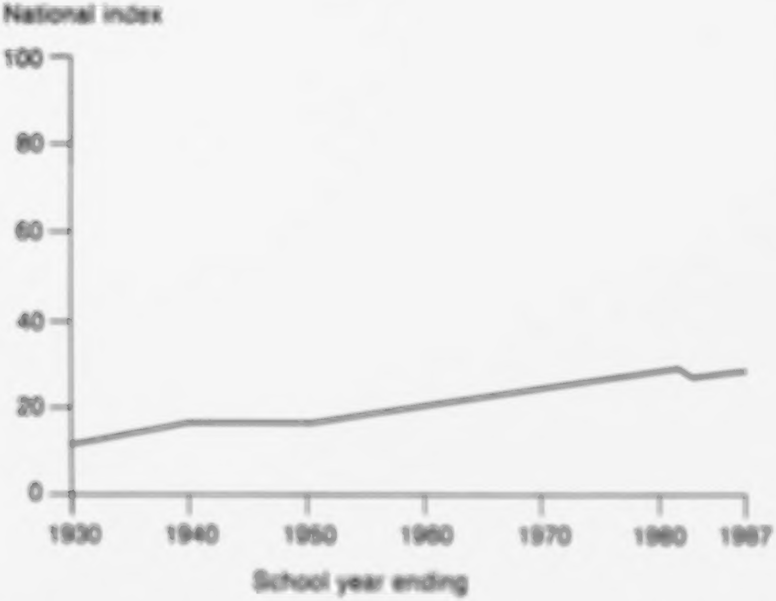
[1] Per pupil education revenues are the ratio of total public school education revenues to public school enrollment. Per capita income is the ratio of total personal income to total population. This formula can also be expressed, therefore, as a function of four variables:

$$\frac{\dfrac{\text{public education revenues}}{\text{total personal income}}}{\dfrac{\text{public school enrollment}}{\text{total population}}} \times 100$$

Chart 1:10.—Trends in the national index of public school revenues per pupil in relation to per capita income: Selected school years ending 1930-1987



SOURCE: National Center for Education Statistics, *Digest of Education Statistics*, 1980, 1988. National Education Association, *Estimates of School Statistics 1986–87*, 1987. Bureau of Economic Analysis, *State Personal Income*, 1984, and Regional Economic Information System, August 1987.

TEXT NOTE: This formula does not include private school enrollments or revenues, nor does it take into account other types of support of the public schools, such as volunteer work by parents.

TEXT SOURCES: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics*, 1988 (based on Common Core of Data Surveys, various years); and unpublished data. National Education Association, *Estimates of School Statistics*, 1986–87, 1987, copyrighted (all rights reserved). U.S. Department of Commerce, Bureau of Economic Analysis, *State Personal Income: 1929–82*, 1984, and *Regional Economic Information System*, August 1987.

Indicator 1:11 Staff employed in public school systems

- **Since 1959–60, the proportion of classroom teachers has declined from 65 percent to 53 percent of total staff in the public schools.**
- **In the past 5 years, the composition of public school staff has changed little.**

To operate today's public school systems, districts employ a large variety of personnel besides teachers, from district-level administrators to building maintenance workers. Diverse factors may cause the number and categories of staff to change. These factors include demographic changes as well as policy decisions at all levels of government. Examples include: (1) changes in pupil enrollment, including an influx of students with special needs; (2) changes in the pupil/teacher ratio resulting from school policy modifications; (3) legislative requirements affecting instruction or school operations; (4) the increased use of different types of instructional personnel, such as teacher aides; and (5) the addition of noninstructional tasks.

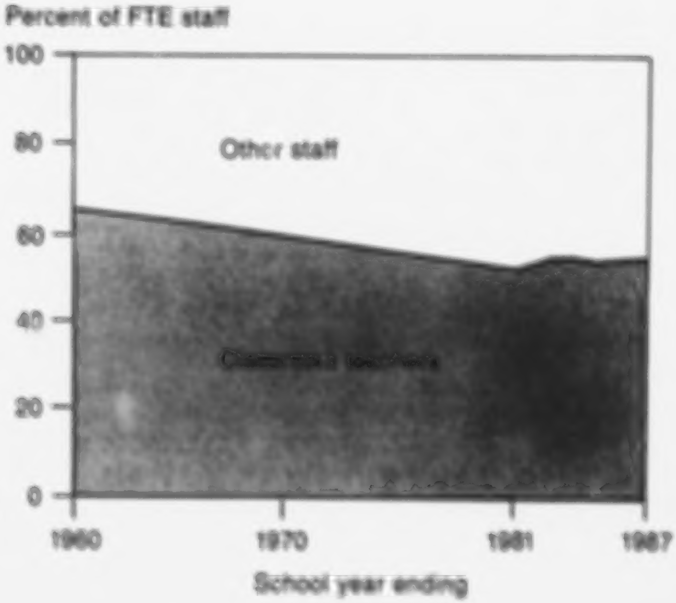
Over the last few decades, the number and types of staff employed by the public school systems of this country have changed considerably. Between school years 1959–60 and 1986–87, total full-time-equivalent (FTE) staff doubled (from about 2 million to a little over 4 million). The number of teachers employed grew substantially (from nearly 1.4 million to more than 2.2 million). Despite this growth, the percentage of teachers in relation to the total staff declined during this period from 65 percent to 53 percent as the hiring of other types of staff increased.

In school year 1986–87, school systems employed about 4.2 million FTE staff. If instructional support staff (instructional aides, guidance counselors, and librarians) are added to classroom teachers, the dominant category, instructional personnel, accounted for more than 63 percent of total staff. Administrators and administrative support staff comprised 13 percent, while other support staff (e.g., bus drivers, security officers, and cafeteria workers) made up the remaining 24 percent.

Over the last 5 years, the percentages of classroom teachers, instructional support, administrators and administrative support, and other support have changed very little. But the number and composition of public school staff could change in the next several years in view of a projected increase in public elementary school enrollment, new teacher hiring policies and practices, and possible changes in pupil/teacher ratios (see *Indicators 1:13, 1:14, and 1:17*).

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Statistics of State School Systems*, various years; and special tabulations, 1987.

Chart 1:11.—Classrooom teachers as a proportion of total public school staff: Selected school years ending 1960, 1970, 1981, and 1983-1987



SOURCE: National Center for Education Statistics, *Statistics of State School Systems*; and special tabulations, 1987.

B. Resources: Human Resources

Indicator 1:12 Average annual salary of public school teachers

- **Since 1980–81, average teacher salaries, adjusted for inflation, have risen almost 18 percent after a decline in the 1970s.**
- **Teacher salaries at both the elementary and secondary levels have risen at about the same rate (18 percent and 17 percent) in the 1980s.**
- **In 1987, teachers regained the buying power they had in the early 1970s.**

The first wave of education reform in the United States, beginning in the early 1980s, was characterized by increased regulation of education, including the teaching profession. By contrast, the current second wave of reform has emphasized the need to improve education by enhancing the status and professionalism of teachers.[1] In this context, many State and local school districts have raised teacher salaries in the hope of attracting and retaining more and better teachers.

During the 1970s, the buying power of the average teacher declined. By contrast, salaries for both elementary and secondary school teachers rose between school years 1980–81 and 1986–87. Average salaries, when adjusted for inflation,[2] increased by 18 percent; unadjusted, they grew by over 50 percent.

Education officials across the country are currently experimenting with teacher salary structures, creating new career steps, career ladders, merit pay schemes, and new positions with greater authority and responsibility. If these experiments prove successful and become widespread, teacher salaries should continue to rise.[3]

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[1] L. Darling-Hammond and B. Berry, *The Evolution of Teacher Policy*, Center for Policy Research in Education, May 1987.

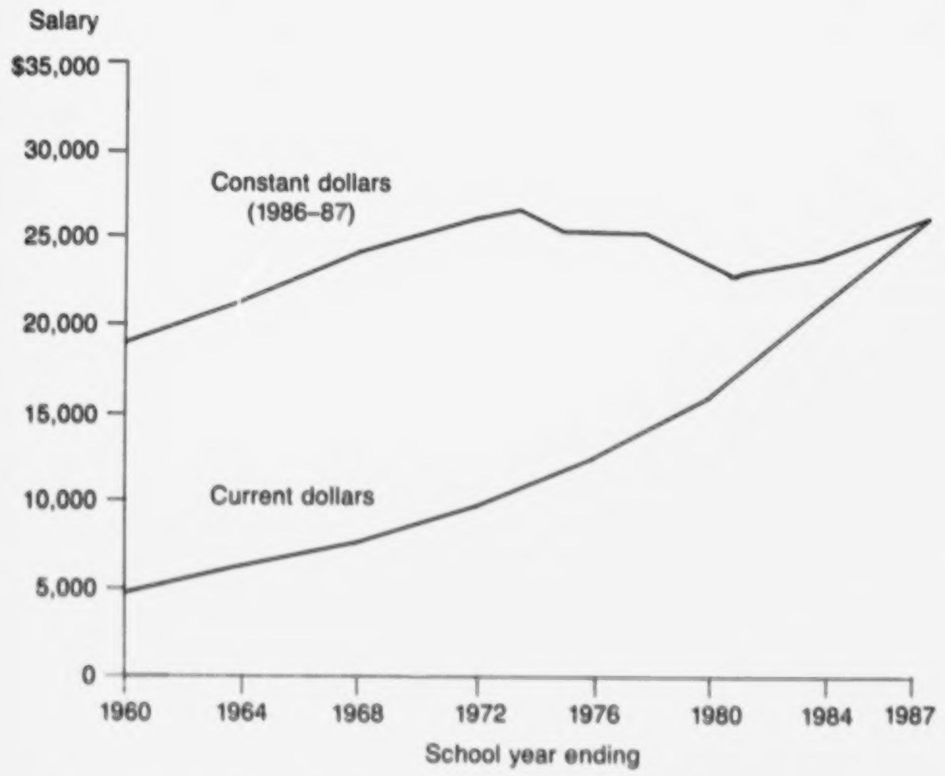
[2] Based on the Consumer Price Index, prepared by the Bureau of Labor Statistics, U.S. Department of Labor, and adjusted to a school-year basis.

[3] Carnegie Forum on Education and the Economy, *A Nation Prepared*, 1986.

NOTE: These salary data of public school teachers are from the National Education Association. Salary data are also collected and published by the American Federation of Teachers. Their latest research report is *Survey & Analysis of Salary Trends, 1987.*

SOURCE: National Education Association, *Estimates of School Statistics 1986–87*, 1987, copyrighted (all rights reserved).

Chart 1:12.—**Trends in average annual salary of teachers in the public schools: Selected school years ending 1960–1987**



SOURCE: National Education Association, *Estimates of School Statistics*, various years.

B. Resources: Human Resources

Indicator 1:13 Pupil/teacher ratios

- **Pupil/teacher ratios are highest in elementary schools and lowest in combined schools and increase with school enrollment.**
- **When school size and level are taken into account, pupil/teacher ratios in public and private schools are not significantly different.**
- **Between 1971 and 1988, pupil/teacher ratios in public schools declined almost 21 percent, from 22.3 to 17.7 students per member of the instructional staff.**

One measure of teacher workload, or the number of students a teacher teaches, is pupil/teacher ratio. It reflects the relationship between the number of students enrolled and the number of (full-time-equivalent) instructional personnel[1] available to teach them. Another measure is class size, which is based on reports from classroom teachers about the number of students in their classrooms. Workload is of interest because of the popular assumption that students in smaller classes benefit from greater attention and that higher achievement will result. Research data, however, have generally not supported this assumption.[2]

In the mid-1980s, pupil/teacher ratios varied by school size and level. As the chart shows, elementary schools had considerably higher ratios than secondary schools, whose ratios in turn were somewhat higher than combined schools'. Moreover, pupil/teacher ratios increased with school size; that is, larger schools enrolled more students per teacher. When both level and size of schools are taken into account, private school pupil/teacher ratios were not different from those of public schools.[3]

Public school pupil/teacher ratios have shown a steady decline since 1971, when the ratio was 22.3 to 1 in the public schools. In 1988, the ratio is estimated to be down to 17.7 to 1, a decline of almost 21 percent.

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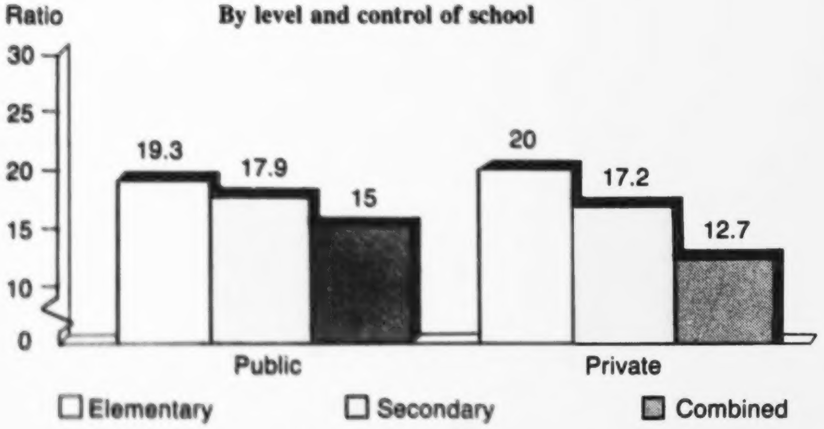
[1] Full-time-equivalent teachers include not only regular classroom teachers but also those—such as art, music, and special education teachers—who do not have regular classroom assignments, but exclude staff providing educational services outside the classroom, such as counselors and librarians.

[2] U.S. Department of Education, Programs for the Improvement of Practice, *Class Size and Public Policy: Politics and Panaceas*, March 1988.

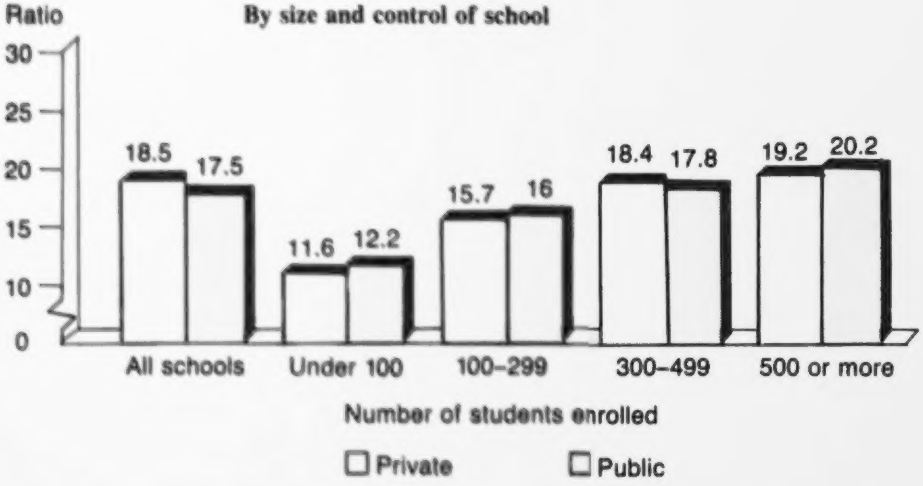
[3] In public schools, the decrease in ratios from elementary to secondary to combined levels was most notable in small schools. It was smaller in medium-sized schools and almost absent in large schools. For private schools, the reverse was the case—the association between level and pupil/teacher ratio was strongest in the largest schools, those with 500 or more students.

SOURCE: U.S. Department of Education, Center for Education Statistics, 1985–86 Private School Survey and 1985 Public School Survey, unpublished tabulations.

Chart 1:13.—Pupil/teacher ratios in public and private schools


By level and control of school

NOTE: Elementary schools contain no grade higher than 8. Secondary schools contain no grade lower than 7. Combined schools contain all other grade spans, such as K-12 or ungraded.


By size and control of school

SOURCE: National Center for Education Statistics, 1985–86 Private School Survey and 1985 Public School Survey.

Indicator 1:14 Demand for new hiring of public school teachers

- **The projected annual demand for new hiring of elementary school teachers in public schools is expected to jump between 1988 and 1989 and then stabilize somewhat through 1997.**
- **For secondary school teachers, the projected annual demand is expected to increase rapidly from 1988 until 1995 before declining.**

Projections of the need for hiring teachers in the next decade are useful to school officials, policymakers, and potential teachers. Demand is affected by fluctuations in student enrollment, changes in pupil/teacher ratio, and teacher turnover, including retirement.[1]

Demand for new hiring is expected to swell more than 35 percent by 1995, when it will peak. Most of this increase can be attributed to a rise of almost 80 percent in new hiring at the secondary school level between 1988 and 1995. While secondary schools will seek to fill 48,000 teaching slots this fall, about 86,000 positions will be open in 1995. Larger enrollments should contribute to greater demand for new hiring of elementary school teachers earlier, in the late 1980s, but should level off slightly in the 1990s. New hiring at the elementary level over the projection period should rise by 11 percent. Actual numbers of annual new hires for public elementary schools are expected to remain consistently higher than those for secondary public schools between 1988 and 1997.

Depicted are national trends. But demand for new hires varies by geographical location and subject area as States experience different rates of teacher turnover and of enrollment growth. Those recruited would include new college graduates, teachers obtaining certification via alternative routes, graduates in earlier years who are qualified but never taught, and former teachers returning to the profession.[2]

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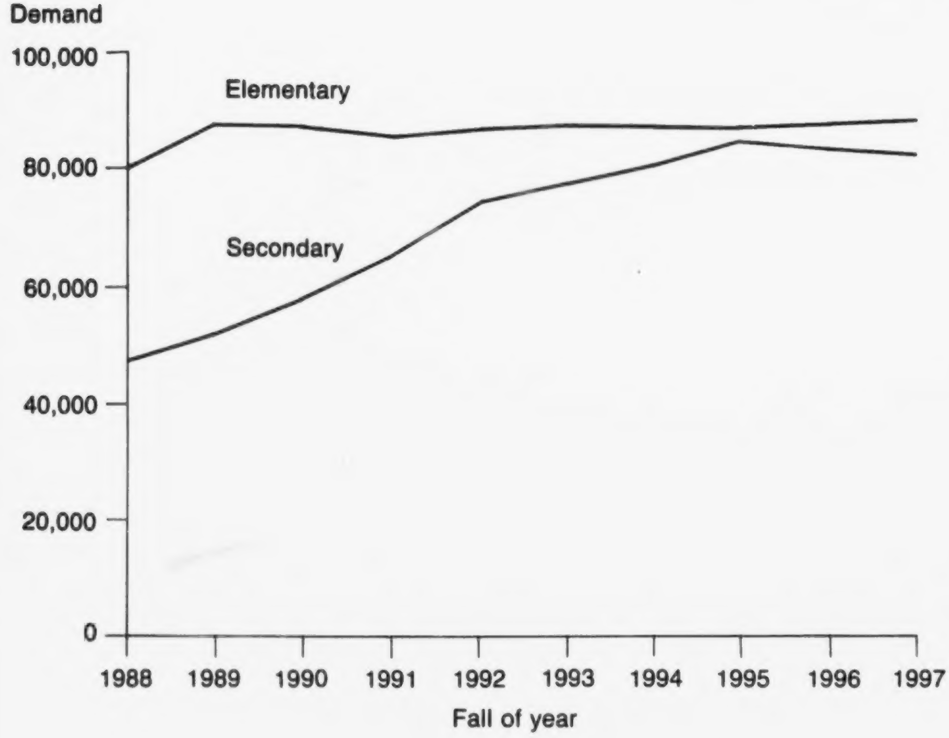
[1] These projections assume teacher turnover rate to be 4.9 percent at the elementary level and 5.6 percent at the secondary level (Bureau of Labor Statistics, unpublished tabulations). Turnover accounts for a far greater share of new hiring than do other factors, including enrollment increases.

[2] National Research Council, *Toward Understanding Teacher Supply and Demand.* (Washington, D.C.: National Academy Press, 1987), p. 3.

NOTE: Projections are substantially revised from previously published figures due to changes in projection methodology by the National Center for Education Statistics.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Projections of Education Statistics to 1997–98*, forthcoming.

Chart 1:14.—Projected demand for new hiring of teachers, by level: Fall 1988–1997



SOURCE: National Center for Education Statistics, *Projections of Education Statistics to 1997–98*, forthcoming.

Indicator 1:15 Difficulty in hiring fully qualified high school teachers

- **Over half of public and private high school principals surveyed in 1985–86 reported that their schools had trouble hiring fully qualified teachers in physics, chemistry, computer science, mathematics, and foreign languages.**
- **Rural high school principals were more likely than suburban principals to report difficulty in recruiting qualified mathematics, biology, earth science, special education, and general science teachers.**

The ease with which teaching positions are filled varies for many reasons. For a prospective teacher, certain geographic areas or types of communities may be seen as more or less attractive. Incentives and benefits packages can also influence the decision to accept employment. Graduates in some disciplines may more readily obtain better-paying jobs in business and industry.[1] Clarifying problems in recruitment may help define the need for new policies by schools, school boards, and others committed to developing a cadre of qualified teachers.

Public and private school principals who were in the market for teachers had difficulty filling vacancies with fully qualified teachers in several subjects.[2] Almost three quarters of the principals seeking to fill physics positions had trouble finding qualified applicants. In addition, over 60 percent of the principals surveyed had difficulty hiring chemistry and computer science teachers and over half had difficulty hiring mathematics and foreign language teachers. Almost none of the principals reported having trouble hiring qualified social studies teachers.

Rural school principals reported more difficulty in hiring fully qualified teachers of mathematics, biology, earth science, special education, and general science than suburban school principals. In some subjects, the difference was quite large. Biology, for example, is a course virtually all high schools offer (see *Indicator 1:25*). Yet half of the rural school principals reported difficulty versus only 13 percent of suburban school principals. Principals in small schools also reported having more difficulty in hiring biology teachers and foreign language teachers than principals in large schools.

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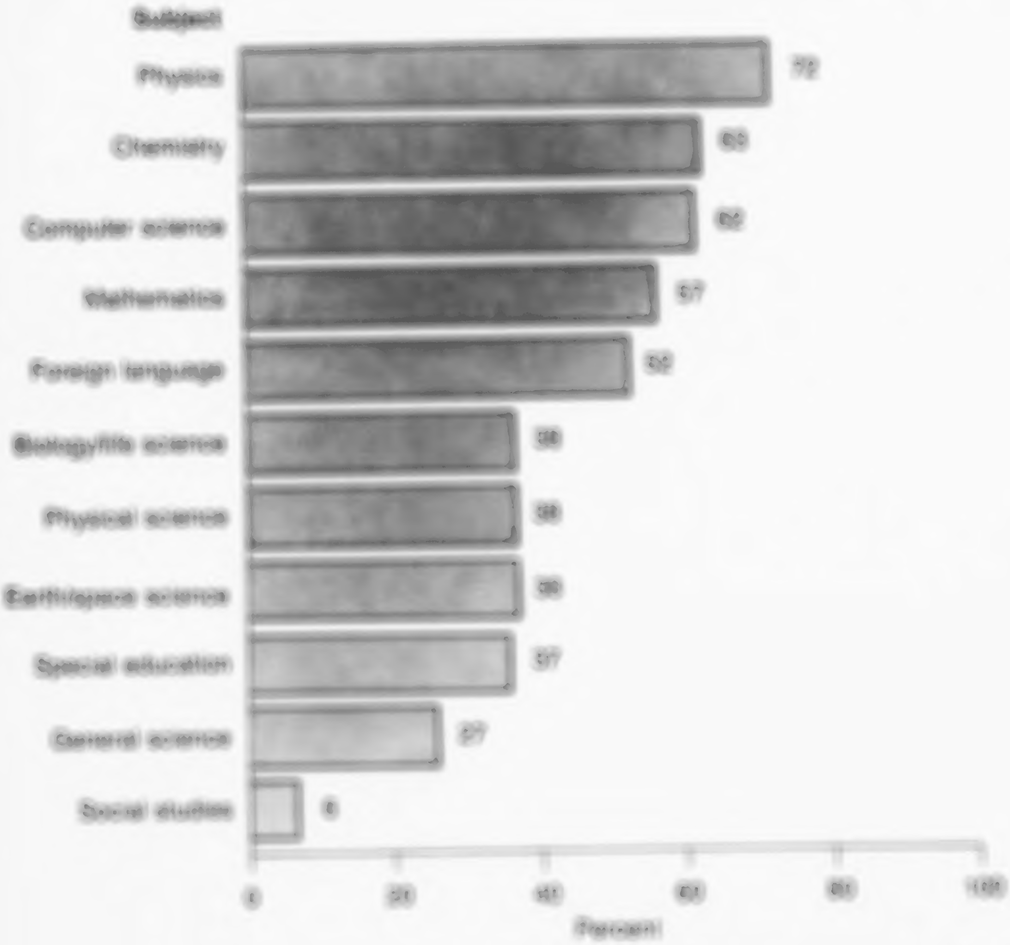
[1] See also Rolf K. Blank, "Science and Mathematics Indicators: Conceptual Framework for a State-Based Network," Council of Chief State School Officers, Washington, D.C., December 1986.

[2] The survey offered no definition of the term "fully qualified teachers" and provided no guidance to the principals on how to interpret this question.

SOURCE: Iris R. Weiss, *Report of the 1985–86 National Survey of Science and Mathematics Education*, Research Triangle Institute, 1987; and personal communication with the author.

Chart 1.13.—Percent of high school principals who reported difficulty in hiring fully qualified applicants for teaching vacancies, by subject: School year ending 1986



SOURCE: National Science Foundation, National Survey of Science and Mathematics Education, 1985-86.

Indicator 1:26 Public and private school enrollment trends

- After a period of relative stability in the early 1980s, public elementary school enrollment rose in 1988, while private elementary school enrollment remained essentially unchanged.
- Public high school enrollment rose during the early and mid 1970s but then began a downward trend through the early 1980s and has stabilized since; private high school enrollment changed little during this period.

Education in the United States today benefits from long historical traditions regarding funding and control of its schools. The tradition of tax support for public education is complemented by a history of private funding of private schools sponsored by religious organizations and nonparochial, or independent, groups.

Elementary school enrollment dropped sharply in both public and private schools in the 1970s, but changed little during the first half of the 1980s. An increase in public elementary enrollment occurred in 1988. High school enrollment in public schools rose in the early to mid 1970s and then turned downward, continuing on that path through the early 1980s. It has stabilized since.[1] Private high school enrollment has remained relatively stable since 1970.[2]

Relative to total enrollment, the percentage of private school enrollment has remained fairly stable since 1970. In 1988, almost one in nine students in kindergarten through grade 12 attended a private school.[3]

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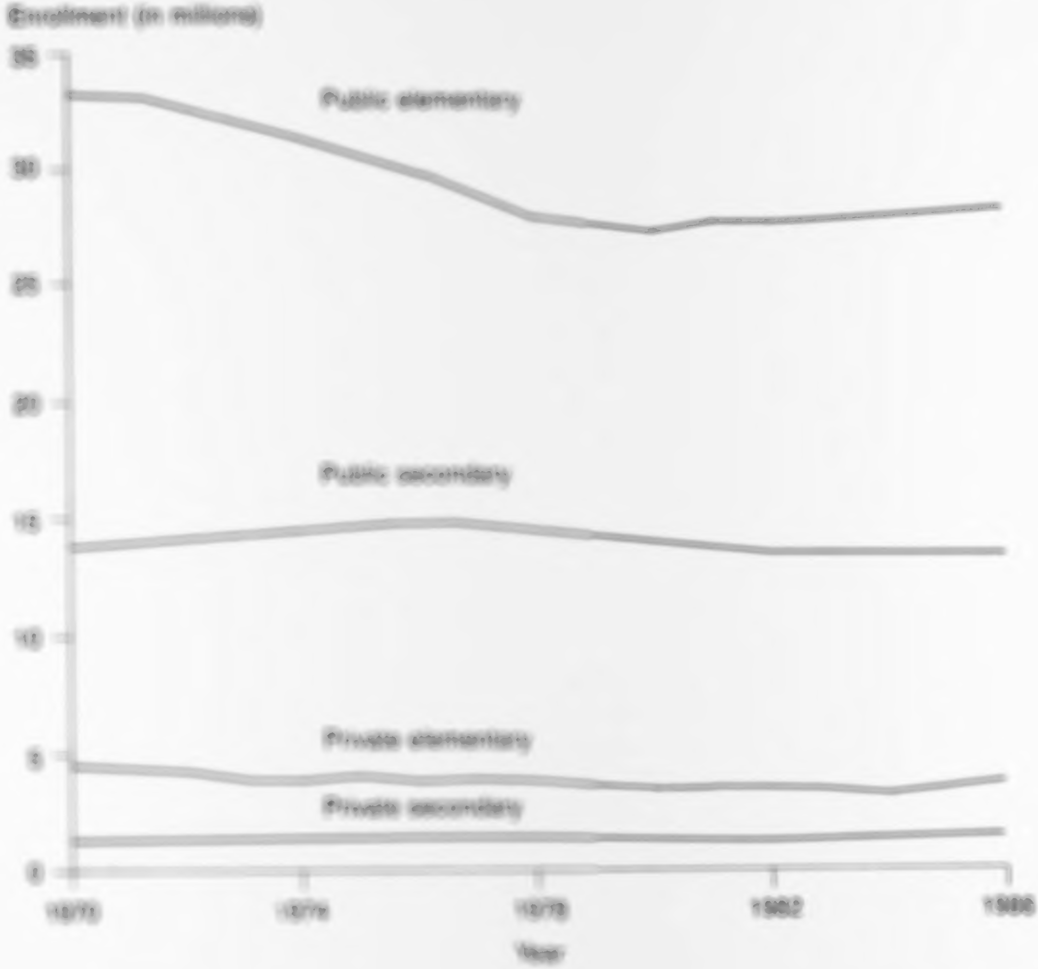
[1] See Indicator 1:17 for a discussion of projected public school enrollment to 1997. Projected enrollments are not available for private schools.

[2] An unexplained drop occurred in the number and proportion of private school students in 1984, according to the Bureau of the Census. However, the 1984 data appear to be an anomaly, since the 1985 and 1986 figures are consistent with the trend for 1970 to 1983.

[3] There are two major sources of national data on private school enrollment: the annual School Enrollment Supplement to the October Current Population Survey (CPS) and intermittent Private School Surveys conducted by the National Center for Education Statistics. The two sources sometimes produce differing estimates of the total number and proportion of private school students. For example, the 1985 Private School Survey reported that [illegible] percent of K-12 students were enrolled in private schools; CPS estimated [illegible] percent. CPS data were used in this indicator because they are the only available data consistent over time. For further discussion of data sources on private school enrollment, see U.S. Department of Education, The Condition of Education, 1990 Edition, pp. [illegible].

SOURCE: U.S. Department of Commerce, Bureau of the Census, "School Enrollment—Social and Economic Characteristics of Students: October 1984 (Advance Report)" and "October 1988 (Advance Report)," Current Population Reports, Series P-20, Nos. [illegible] and [illegible], and personal communication.

Chart 1:16. – Trends in public and private school enrollment, by grade level: 1970-1986



SOURCE: Bureau of the Census, Current Population Reports, and personal communication with the author.

Indicator 1:17 Trends in public school enrollment: 1969 to 1997

- **Total public elementary/secondary school enrollment declined during most of the 1970s and early 1980s.**
- **Enrollment in public elementary schools began to increase in 1985 and is projected to continue rising through 1996.**
- **The number of public secondary school students is expected to continue falling and then begin increasing in 1991.**

The number of students enrolled in schools affects the demand for teachers, facilities, and other educational resources. Enrollment varies at different grade levels and in different localities. State and local education officials must weigh enrollment patterns when deciding how to allocate their often limited resources.

Total public elementary and secondary enrollment declined steadily through most of the 1970s and into the early 1980s as the baby-boom generation grew older and moved through and out of the school system. Separately, the pattern for elementary and secondary enrollment[1] differed somewhat from the total enrollment trend. The number of elementary school students reached a record high in 1969, while secondary school enrollments peaked in 1976.

In part because the children born during the baby boom years of 1946 to 1964[2] tended to delay marriage and childbearing, their offspring did not begin to produce a rise in public school enrollment figures until 1985. This baby boomlet is expected to continue swelling the number of elementary school students through 1996 (though the numbers will not return to record levels). Secondary school enrollments are expected to continue falling until 1990, when the large numbers of elementary school students moving on to high school will raise secondary school enrollments.

State-by-State trends in elementary and secondary enrollment, it should be noted, present an extremely varied picture.[3]

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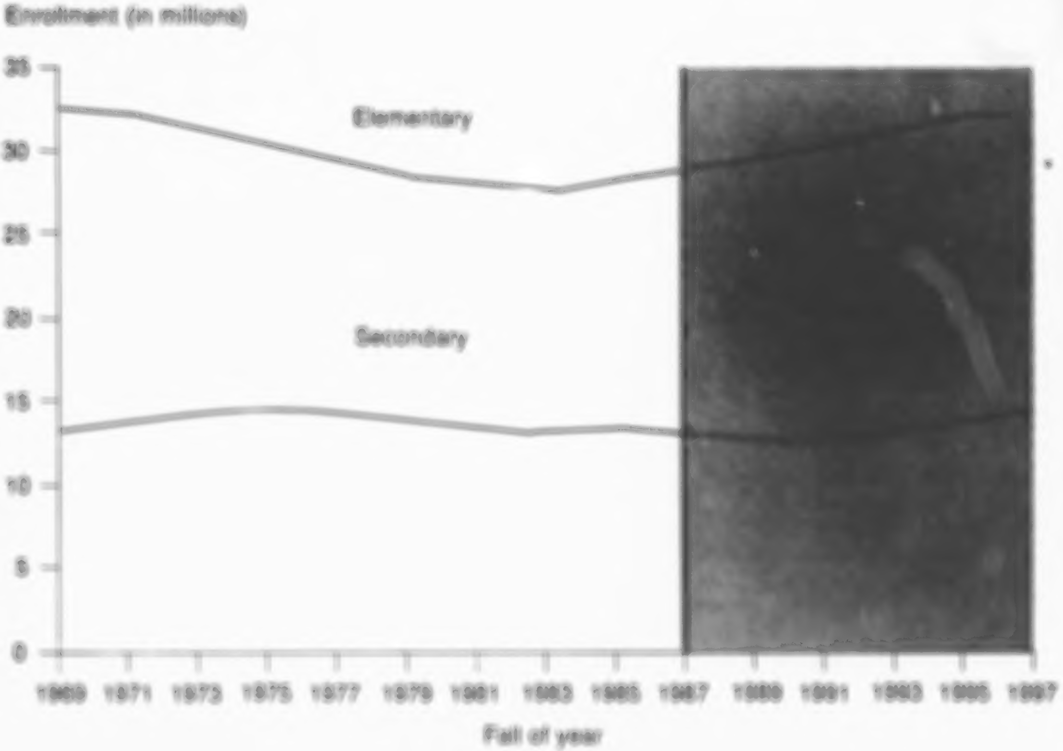
[1] Elementary school enrollment includes most kindergarten and some prekindergarten school enrollment, as well as grades 1 through 8. Secondary school enrollment includes grades 9 through 12.

[2] Leon F. Bouvier, "America's Baby Boom Generation: The Fateful Bulge," *Population Bulletin*, April 1980.

[3] For changes in State public school enrollment from 1975 to 1985, see U.S. Department of Education, National Center for Education Statistics, *Statistical Trends: State Facts 1975 to 1985*.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Projections of Education Statistics to 1997–98*, forthcoming.

Chart 1:17.—Trends in public school enrollment: Fall 1969-1997



SOURCE: National Center for Education Statistics, *Projections of Education Statistics to 1997-98*, forthcoming.

Indicator 1:18 Special education enrollment in federally supported programs

- **The total number of special education students rose between 1978–79 and 1986–87 from 3.9 to 4.4 million, due primarily to the growth in the number of students classified as learning disabled, which exceeded the growth of all the other groups combined.**
- **As a percent of the total public school enrollment, the number of special education students rose from 9.14 percent in 1978–79 to 10.97 percent in 1986–87, but has changed little in the last 4 years.**

The Education of the Handicapped Act, enacted by Congress in 1975, ensures the availability of a "free and appropriate public education" to all children with handicapping conditions.[1] Examining changes in the number and distribution of such students helps educators and policymakers assess the efforts to comply with this mandate and forecast the need to generate more resources.

Since this law was implemented on September 1, 1978, the number of children enrolled in federally supported special education programs has risen each year.[1,2] The increases were primarily due to growing numbers of learning disabled children.[3]

In addition to 52,000 new students in the learning disabled category in 1986–87, the number of students who were identified as speech impaired, seriously emotionally disturbed, or multihandicapped also rose by several thousand. The number of children identified as mentally retarded decreased, continuing a 10-year trend. The number of students classified as having other handicapping conditions remained relatively stable or decreased by small amounts.

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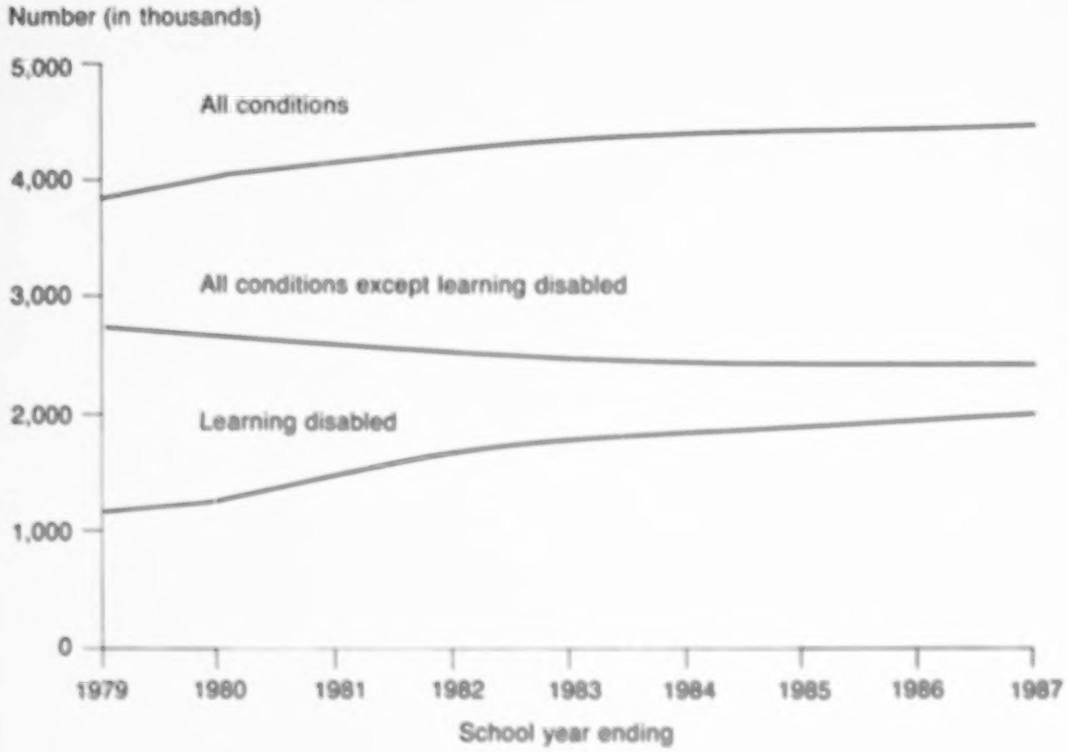
[1] The total count of children in special education programs includes children served under Part B of the Education of the Handicapped Act (EHA-B) and Chapter 1 of the Education Consolidation and Improvement Act in State-Operated Programs (ECIA-SOP).

[2] The figures reflected in this indicator are based on reports from the 50 States and the District of Columbia only (i.e., figures from U.S. territories are not included).

[3] Guidance to the States to address widespread problems of inconsistent identification, classification, and placement procedures used with students with learning disabilities is forthcoming.

SOURCE: U.S. Department of Education, Office of Special Education and Rehabilitative Services, *Annual Report to Congress on the Implementation of the Education of the Handicapped Act*, various years; and unpublished data.

Chart 1:18.—Trends in the number of handicapped students served in federally supported education programs: School years ending 1979-1987



SOURCE: National Center for Education Statistics, Common Core of Data survey. Office of Special Education and Rehabilitative Services, *Ninth Annual Report to Congress on the Implementation of the Education of the Handicapped Act, 1987*; and unpublished data.

Indicator 1:19 Disruptive behavior in the public schools

- **About 44 percent of teachers surveyed in 1987 said that disruptive student behavior had increased in the last 5 years.**
- **In the teachers' view, school discipline policies have improved significantly since 1980; still, half reported that policies were not consistently applied.**

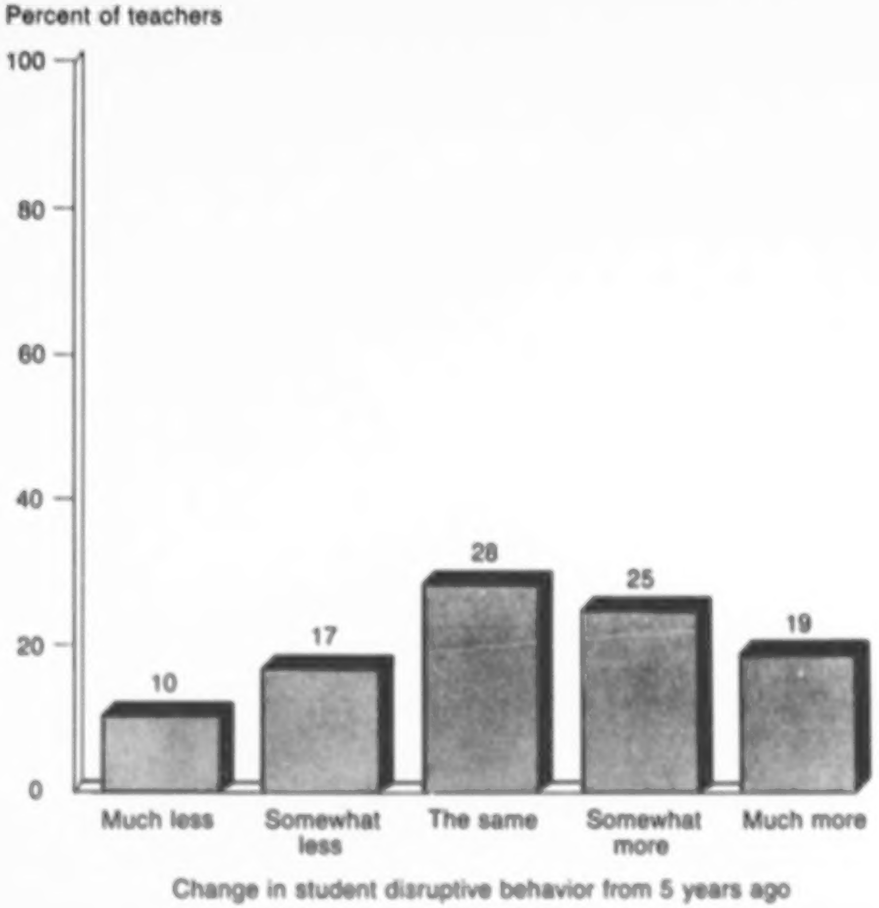
Research on effective schools has identified a safe, orderly environment as a prerequisite to promoting student academic success. Educators and others are therefore interested in examining indices of student discipline and classroom environment.

In assessing the incidence of student disruptive behavior in 1987, 19 percent of public school teachers felt there was "much more" disruptive behavior in their schools than 5 years before; another 25 percent indicated there was "somewhat more" now. Indeed, almost one-third of the teachers surveyed stated they had seriously considered leaving teaching because of student misbehavior.

To obtain trend information on public school teachers' assessment of student discipline, findings from this survey were compared with polls conducted earlier in the 1980s by the National Education Association (NEA). Teachers in the 1987 survey were considerably more positive about the discipline policies of their schools than their NEA counterparts in 1980. So while teachers report an increase in disruptive behavior, perhaps they are finding it interferes less with their teaching because more mechanisms exist for dealing with it. The table below shows various positive characteristics of school discipline policy and the percent of teachers who said these characteristics described their school.

	School discipline policy characteristic				
Year	In writing	Strict enough	Comprehensive enough	Clear	Consistently applied
	Percent				
1980	69	39	42	60	33
1987	93	66	72	80	50
	Rise, in percentage points				
1980 to 1987	24	27	30	20	17

Chart 1:19.—**Changes in student disruptive behavior as reported by teachers: School year ending 1987**



SOURCE: Center for Education Statistics, "Public School Teacher Perspectives on School Discipline," *OERI Bulletin*, 1987.

TEXT NOTE: Some caution is needed in interpreting comparisons of U.S. Department of Education survey figures and those of the NEA Teacher Polls, as the differences may be due in part to methodological variations between the studies.

TEXT SOURCE: U.S. Department of Education, Center for Education Statistics, "Public School Teacher Perspectives on School Discipline," *OERI Bulletin*, 1987.

C. Context: Learning Environment

Indicator 1:20 Student drug and alcohol abuse

- **Cocaine use among high school seniors dropped significantly in 1987, the first such decline since 1975.**
- **While alcohol use has generally declined since 1979, rates remain high. In 1987, about two of every three seniors reported using alcohol in the month preceding the survey.**

Learning is a thinking process, and drugs interfere with thinking and reduce academic achievement. Neighborhoods near schools often are magnets for drug dealers, who can be students themselves. Crimes of violence may accompany or result from substance abuse. In these circumstances, school effectiveness and student achievement, not limited only to the abusers, can suffer. Nationally, millions of dollars are spent to combat drug abuse and related crimes and to rehabilitate individuals who have become chemically dependent.

Drug and alcohol abuse, despite its health- and life-threatening consequences, is widespread among American students. Acquaintance with such substances—whether sedatives, hallucinogens or stimulants—generally begins in adolescence and, increasingly, at even younger ages. While alcohol and illegal drug use has declined in the 1980s, it remains widespread. For example, by the time they are high school seniors, nearly 6 out of 10 students have tried an illicit substance.

The rise in cocaine use among students has been particularly dramatic in the last decade or so. In just 4 years, from the class of 1975 to the class of 1979, the proportion of students who reported using cocaine in the past year doubled, going from almost 6 percent to 12 percent. Annual cocaine use peaked in 1985 at 13 percent. By 1987, the proportion had dropped to slightly more than 10 percent. Similarly, the number of high school seniors who reported using cocaine in the previous 30 days declined from almost 7 percent in 1985 to just over 4 percent. There is evidence, however, that the inexpensive and highly addictive form of cocaine called "crack" has not followed the general decline in cocaine usage, especially in urban areas and among high school dropouts.*

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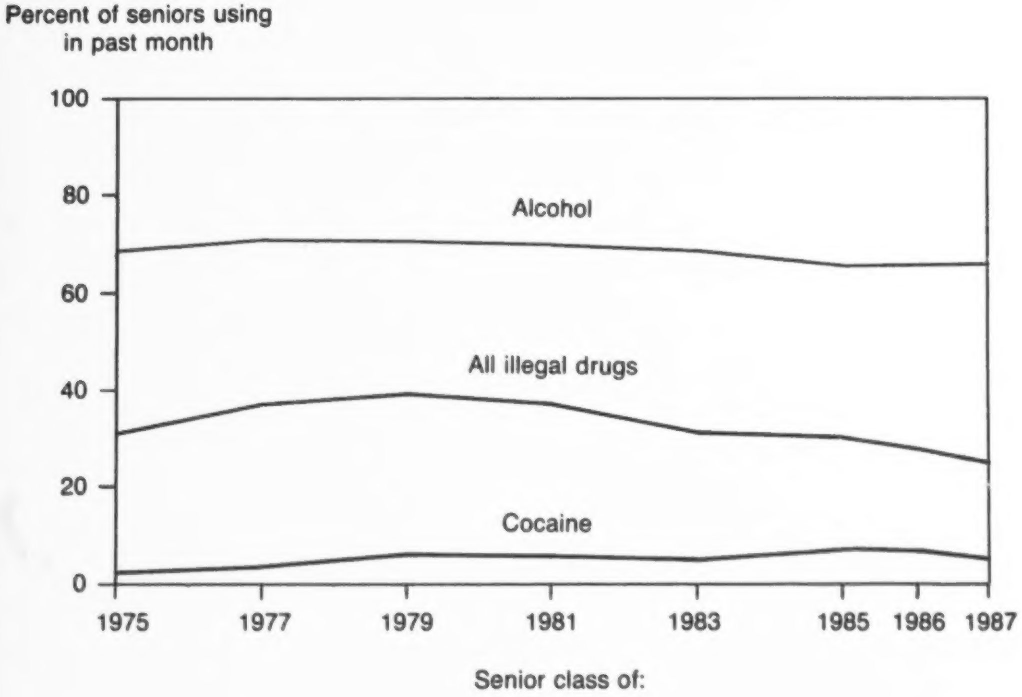
*"Young Adults Show Drop in Cocaine Use," *The New York Times*, January 14, 1988.

SOURCE: U.S. Department of Health and Human Services, Alcohol, Drug Abuse and Mental Health Administration, National Institute on Drug Abuse, *Drug Use Among American High School Students, College Students, and Other Young Adults*, 1986; and personal communication with the author. See also U.S. Department of Education, *Schools Without Drugs*, 1986.

Chart 1:20.—Trends in the use of drugs and alcohol by high school seniors: Selected years, 1975–1987



SOURCE: National Institute on Drug Abuse, *Drug Use Among American High School Students, College Students, and Other Young Adults*, 1986; and personal communication with the author.

Indicator 1:21 School climate and reading performance

- **Students enrolled in schools with numerous problems have lower reading scores than students in schools where factors such as absenteeism, lack of parent interest, and discipline problems are not as prevalent.**
- **High school principals considered problems in their schools to be more serious than elementary school principals, especially in the areas of absenteeism, teacher motivation, low standards for students, and vandalism.**
- **Principals' average ratings of school problems indicate that private schools have fewer problems than public schools, particularly at the high school level.**

A positive school climate encourages learning. Principals, teachers, parents, and students work together to reinforce the importance of achievement. Educators can contribute to an effective learning environment by emphasizing priorities, such as basic skills and academic success, high expectations for all students, a safe and orderly atmosphere, and parental involvement.[1]

Principals were asked to rate eight potential problems[2] in their schools. Students where these factors were rated as "minor" or "moderate" had lower reading scores than students in schools where they were not considered problems. The difference was significant after taking into account student background characteristics such as race/ethnicity, parental education, and reading materials in the home.

High school principals rated their school problems as more serious than did elementary school principals. Lack of parent interest and lack of discipline were identified as minor or moderate problems in two-thirds of all schools. In 1 out of 10 high schools, student absenteeism and lack of parent interest were rated as "serious."

Principals' average rating indicates that private schools experience fewer problems than public schools, particularly at the high school level.

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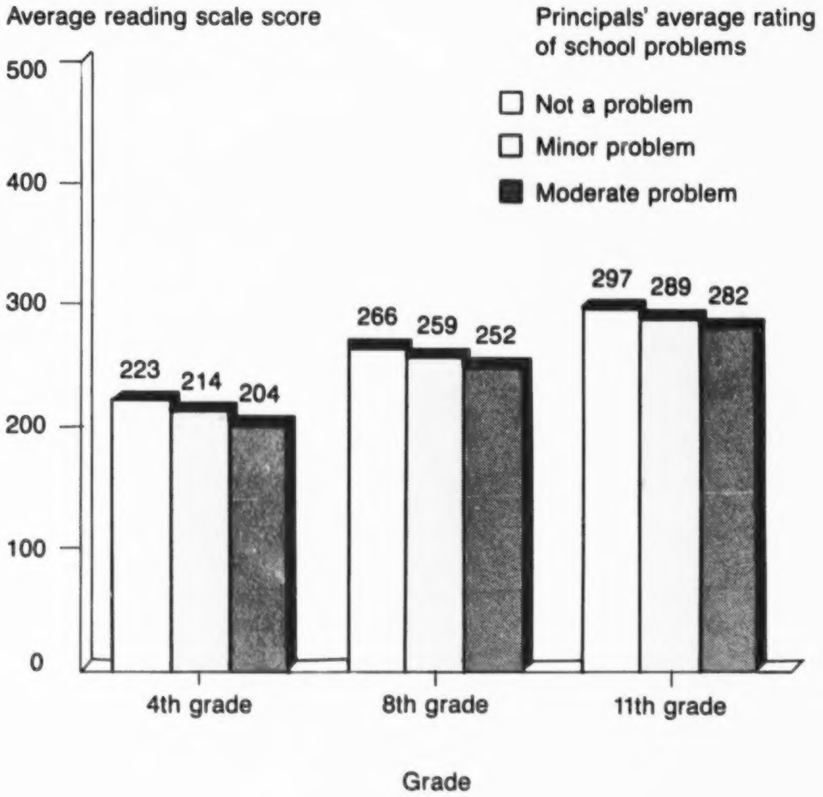
[1] U.S. Department of Education, Office of Research, *Reaching for Excellence: An Effective Schools Sourcebook*, 1985. See also S. C. Purkey and M. S. Smith, "Effective Schools: A Review," *The Elementary School Journal*, vol. 83 (4) (March 1983): 427–452.

[2] The eight potential school problems were student absenteeism, lack of parent interest, lack of discipline, lack of teacher commitment/motivation, teacher absenteeism, teacher turnover, low standards for students, and vandalism. The average rating on school problems is the average rating of the eight potential problems within each school. No schools had an average of "serious."

SOURCE: U.S. Department of Education, National Center for Education Statistics, "School Problems and Reading Performance," *Survey Report*, forthcoming.

Chart 1:21.—Average adjusted reading proficiency, by average rating on school problems and grade: 1984



NOTE: Reading proficiency scale scores were adjusted for race/ethnicity, language spoken in the home, parental education, and number of reading aids in the home.

SOURCE: National Center for Education Statistics, "Schools Problems and Reading Performance," *Survey Report*, forthcoming.

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C. Context: Perceptions

Indicator 1:22 Perceptions of student problems and education improvement strategies

- **Teachers feel that a major reason students have difficulties in school is because they "are left on their own after school."**
- **Parents, more than teachers, feel that school-initiated policies can improve education.**

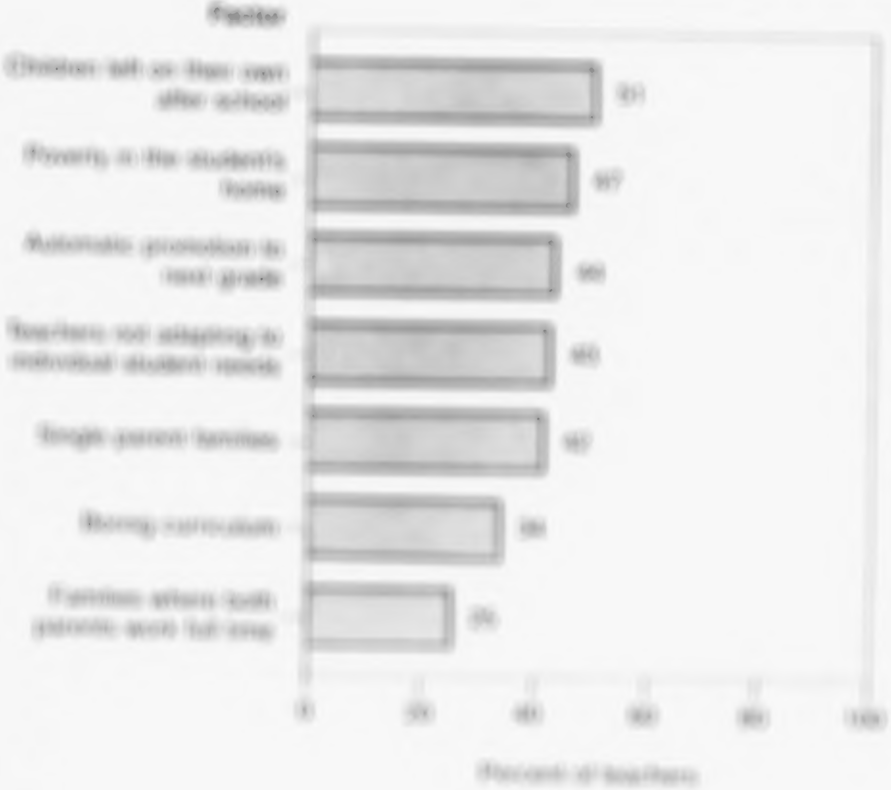
Research has shown that students with behavioral and academic problems could be potential school dropouts. In a 1987 survey, teachers clearly viewed the phenomenon of "latch-key" children as a major problem. Half of the teachers surveyed felt that "children who are left on their own after school" was a major cause of school difficulties. Poverty in the student's home was the second most frequently cited cause. It was the most frequent cause cited among teachers in districts of below average wealth.

In order to further explore the factors associated with student problems, parents and teachers were both asked to rate the extent to which they felt each of seven criticisms of parents was valid. About 80 percent of both teachers and parents surveyed felt that "many" or "most" parents "leave their children alone too much on their own after school." While 17 percent of parents of public school children surveyed acknowledged that their children are alone after school 1 to 5 days per week, 29 percent said that their child is left alone almost every day. Parents of black students and of junior high and high school students are the most likely to say that their children are on their own almost every day after school. But this problem is evident across diverse geographical locations, as well as parental income and education levels.

Most solutions to a student's school problems require cooperation between parents and teachers, whether those solutions are school-initiated or home-based. However, on the extent to which they felt the reform would "help a lot" to improve education, parents and teachers surveyed differed on six of seven possible strategies. Of these six, the four that were school-initiated (such as "having the school notify the parents immediately about any problem involving their child") were favored by parents more than teachers. But teachers overwhelmingly supported one home-based strategy ("having parents spend more time with their children in support of school and teachers"). The sixth strategy ("getting teachers and parents to meet together and talk about school policies") involved both home and school.

SOURCE: The Metropolitan Life Survey of The American Teacher, 1987: Strengthening Links Between Home and School.

Chart 1:22.—Percent of teachers who think that each factor is a "major cause" of students' difficulties in school: 1987



SOURCE: The Metropolitan Life Survey of the American Teacher 1987: Strengthening Links Between Home and School.

C. Context: Perceptions

Indicator 1:23 Public opinion of public schools and other national institutions

- The public has consistently rated their own local public schools higher than it has rated the Nation's schools.
- In 1987, the local public schools were rated higher by public school parents than by nonpublic school parents.
- The public's rising "confidence" in schools, beginning in the mid-1980s, follows more than a decade of declining confidence in them and in many other national institutions.

The public schools depend upon public support in a number of ways. Polls of the public's perception of the schools are good gauges of the strength of that support. The annual Gallup Poll of the Public's Attitudes Toward the Public Schools provides data on the public's ratings of the schools. This poll has become a kind of national barometer, closely watched and debated each year by educators and policymakers. For example, the National Commission on Excellence in Education cited findings from the Gallup Poll in its 1983 report, *A Nation at Risk*.

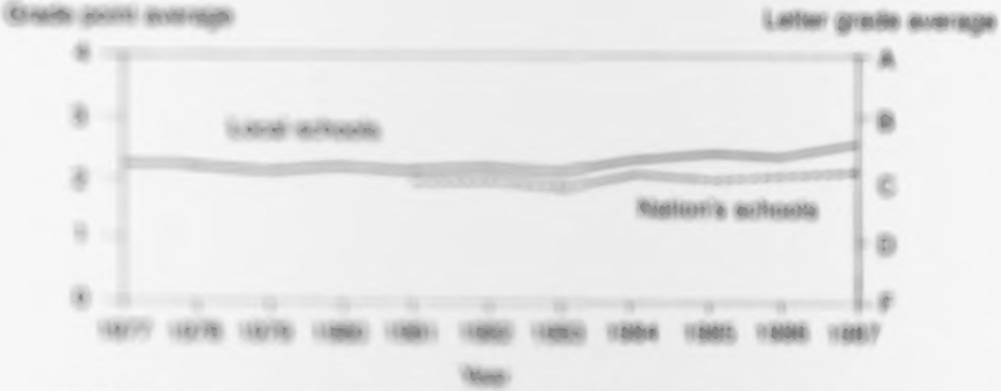
The most recent poll shows that in 1987, the public continued to grade their local schools higher than the Nation's schools as a whole. Local public schools earned a grade point average of 2.44 or C+ in 1987, while the Nation's public schools earned a 2.18 or C. Although unexceptional, these average grades are the highest received since the Gallup organization began asking the public to grade the schools in 1977. In 1983, the public had given both local schools and the Nation's schools their lowest grades (C and C-, respectively).

In recent years, the Gallup organization has distinguished between ratings by public school parents and by nonpublic school parents. In 1987, public school parents gave the local public schools an average grade of almost B-, whereas nonpublic school parents gave the local public schools an average grade of only C.

As another Gallup poll shows, the public's earlier falling confidence was not limited to schools. It had also spread among other national institutions. For many of these, support reached its low point in the early 1980s. But by 1986, the public appeared to be regaining confidence in some institutions, including schools.

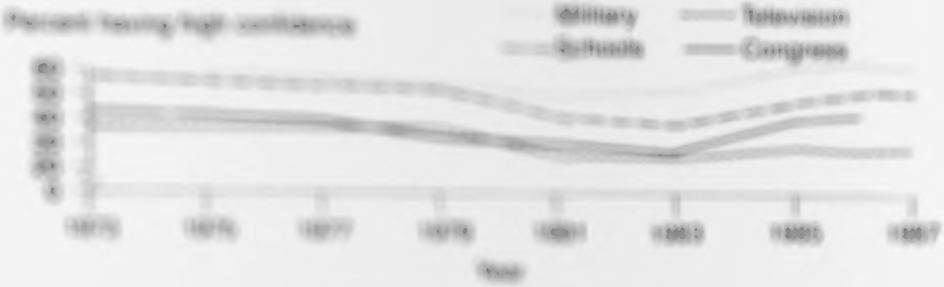
SOURCES: George H. Gallup, "The 19th Annual Gallup Survey of the Public's Attitudes Toward the Public Schools," *Phi Delta Kappan*, September 1987, and *The Gallup Poll*, August 10, 1987.

Chart 1:23A.—Trends in the public's ratings of public schools: 1977–1987



SOURCE: The 19th Annual Gallup Poll of the Public's Attitudes Toward the Public Schools, Phi Delta Kappan.

Chart 1:23B.—Trends in the public's confidence in selected national institutions: Selected years, 1973–1987



SOURCE: The Gallup Poll, August 16, 1987

C. Context: Requirements

Indicator 1:24 Graduation requirements in public and private high schools

- Since 1981, public school districts have increased the number of course hours they require a student to take before graduating from high school.
- Both public and private schools approximated the graduation requirements for English and social studies recommended by the National Commission on Excellence in Education.
- In mathematics and science, graduation requirements for public schools were considerably lower than either private school requirements or the recommendations of the Commission.

Graduation requirements are a measure of the magnitude and direction of academic rigor in the curriculum. They indicate the policy intent of States and local school districts for public schools, and of governing bodies for private schools. Individual students may, and often do, elect a program of studies that exceeds the requirements. In 1983, the National Commission on Excellence in Education drew attention to this measure of school performance by recommending a minimum of 4 years of English and 3 years each of mathematics, science, and social studies.

In the mid 1980s, both public and private schools approximated the Commission's recommendations in English.[1] Public schools almost met, while private schools surpassed, Commission recommendations for social studies. The two sectors were less comparable in their mathematics and science requirements, however. While public school districts had increased their graduation requirements, they still required much less mathematics and science than the Commission recommended, and required about 1 year less than private schools. The districts expected to increase their requirements further by 1987–88.

Public school data reflect both State and local requirements. The 1980s saw a surge both in the number of States establishing requirements and in the number of courses these states required for graduation. By 1988, the District of Columbia and 49 States (all except Colorado) had established a minimum number of units required for high school graduation. Of these, 38 States and the District of Columbia increased the number of units required for graduation.[2]

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[1] The most recent data available are 1985–86 for private schools and 1984–85 for public schools.

[2] For a major statement on State and local roles in the next stage of education reform, see National Governors' Association, *Time for Results: The Governors' 1991 Report on Education*, Washington, D.C., August 1986, and *Results in Education: 1987*, Washington, D.C., 1988.

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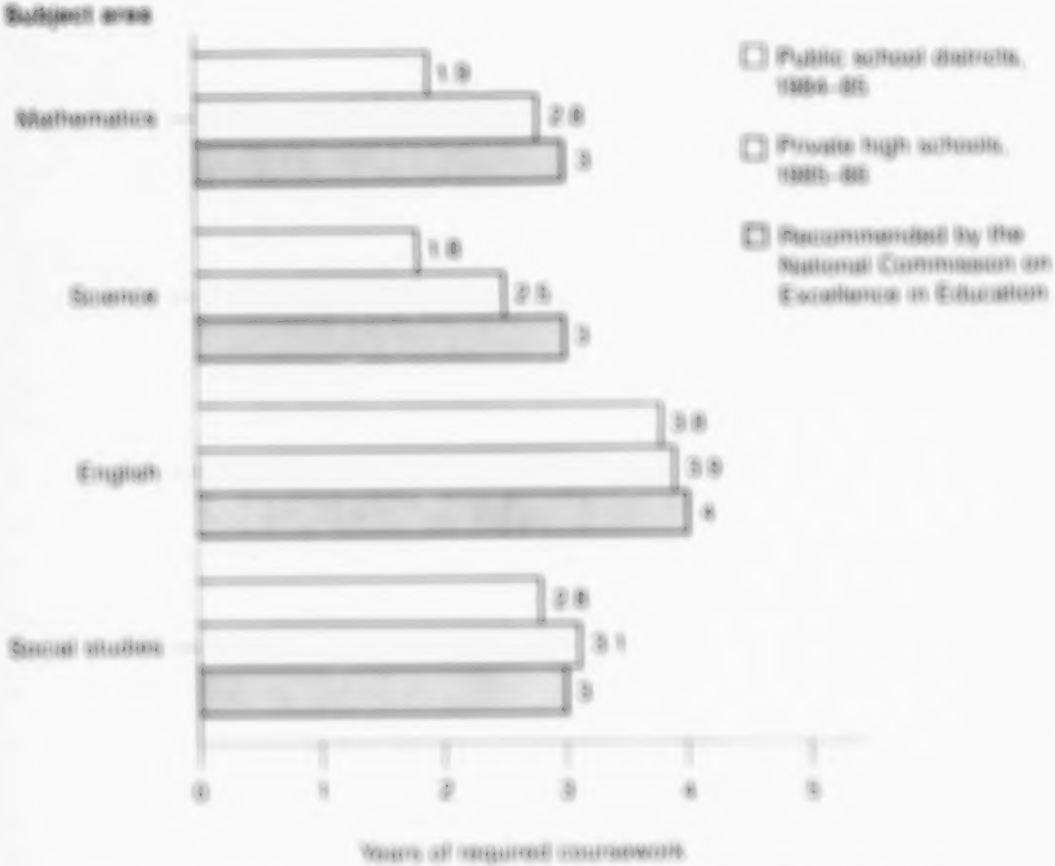
Chart 1:24.—Average years of classwork required for high school graduation



SOURCE: Center for Education Statistics, 1985–86 Private School Survey and 1985 Public School Survey.

TEXT SOURCES: U.S. Department of Education, Center for Education Statistics, "Public High School Graduation Requirements," OERI Bulletin, 1986; *Private Schools and Private School Teachers: Final Report of the 1985–86 Private School Study*, 1987; and unpublished tabulations.

C. Context: Requirements

Indicator 1:25 Availability of advanced math and science courses in high school

- **In 1985–86, nearly all public and private high schools offered biology but relatively few offered calculus.**
- **Small schools were less likely to offer chemistry, physics or calculus than medium or large schools.**
- **Suburban and urban schools were more likely than rural schools to offer calculus; suburban schools were also more likely to offer physics than were rural schools.**

Research has shown that the more time spent learning a subject and the more advanced the subject taken, the higher a student's achievement in that subject (see *Indicator 1:8*).[1] At a time when science and technology are playing an increasingly important role in the world economy, policymakers, educators, and parents are interested in the extent to which advanced mathematics and science courses are offered in high school. Students who lack the opportunity to learn are one result of teacher shortages in mathematics and science (see *Indicator 1:13*). This situation has implications for broad policy issues such as the use of alternative certification routes and incentives for recruiting quality mathematics and science teachers (see *Indicator 1:26*).

In school year 1985–86, 99 percent of all public and private high schools[2] offered biology, about 80 percent offered chemistry, about 60 percent offered physics, and only about 30 percent offered calculus. These percentages varied, however, for schools of different sizes or in different types of communities. Nearly all high schools offered biology, regardless of the size of the school. Chemistry, physics, and calculus, on the other hand, were less likely to be offered by small schools than by medium or large schools. Only one out of five small schools offered calculus, versus about half of medium and large schools. Schools in different types of communities show similar patterns of course availability. Although no difference emerged in the percentage of rural, urban, and suburban schools offering biology, urban and suburban schools were more likely to offer calculus. Small, rural schools were especially unlikely to make calculus available.

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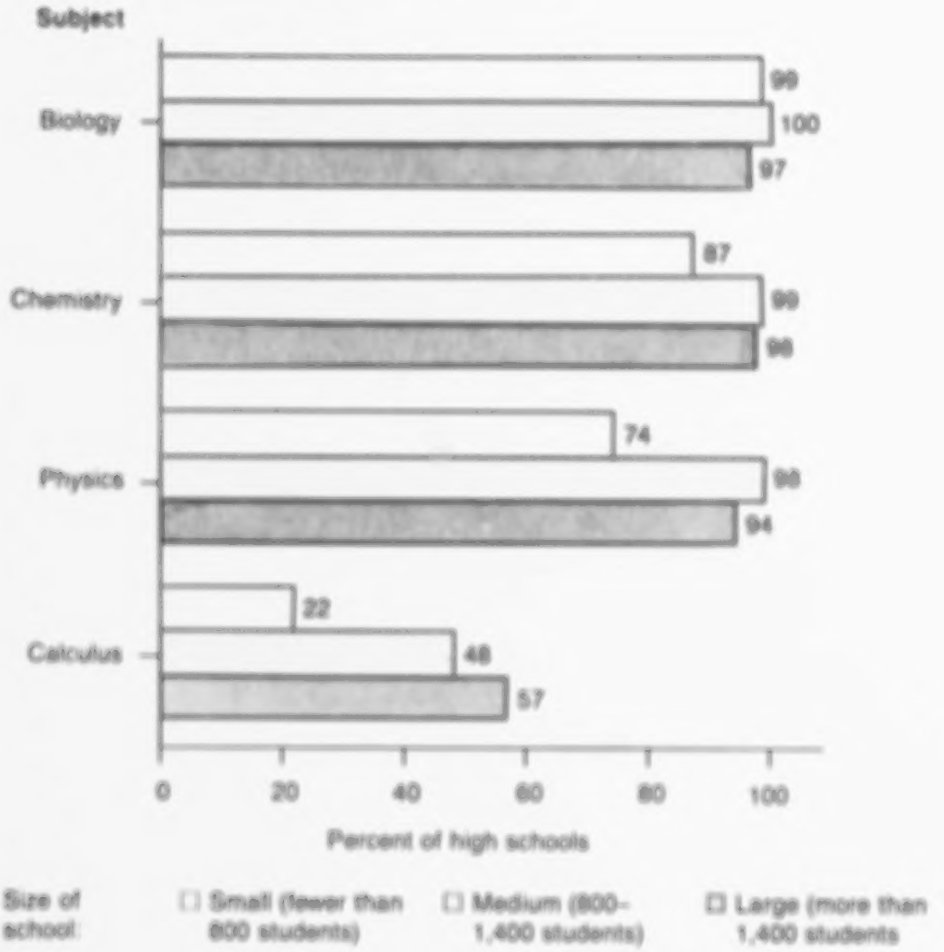
[1] See also L. V. Jones, "White–Black Achievement Differences," American Psychologist, vol. 39, no. 11 (November 1984), and W. R. Borg, "Time and School Learning," Time to Learn (Washington D.C.: U.S. Department of Education, May 1980).

[2] High school is defined as any school containing at least one of grades 10 through 12.

Chart 1:25.—Percent of high schools offering selected courses, by size of school: School year ending 1986



SOURCE: National Science Foundation, National Survey of Science and Mathematics Education, 1985-86.

TEXT SOURCE: Iris R. Weiss, *Report of the 1985-86 National Survey of Science and Mathematics Education*, Research Triangle Institute, 1987, and personal communication with the author.

C. Context: Requirements

Indicator 1:26 Competency testing for teacher certification

- **By fall of 1987, 45 States had enacted competency testing programs as part of the process of initially certifying teachers.**
- **In 31 States, regulations had also required that students take an examination in order to be admitted to a teacher education program.**

The States have taken the lead in the current educational reform movement and have been particularly active in seeking ways to improve the quality of teachers in elementary and secondary schools. To screen new teacher candidates, most States use competency testing, which had its beginnings among Southern States in the mid- to late 1970s. With these tests, States hope to exclude teaching candidates deficient in basic skills and knowledge.

One subject of debate concerns what competency tests should cover. No nationally accepted test exists, so some States use commercially developed tests, and some use tests of their own design. All tests cover basic skills, subject matter, pedagogy (i.e., teaching methods), or a combination.

While no one agrees which test or type of test is most suitable for competency testing, the concept of testing is generally viewed positively by the major teachers' unions and by teachers themselves.[1] The Carnegie Forum on Education and the Economy recently proposed a three-stage voluntary assessment process covering subject matter, education courses, and teaching performance, all under the aegis of a National Board for Professional Teaching Standards.[2]

Many States, perceiving a drop in the number and quality of graduates from teacher education programs, have created alternative routes to certification. The vast majority of teachers, however, will continue to come from traditional postsecondary schools of education. But one striking phenomenon that has become more prevalent in the 1980s is State requirements a student must meet just to be *admitted* to teacher training programs. Thirty-one States required or were developing a competency test for admission to undergraduate or 5-year teacher education programs as of June 1987.

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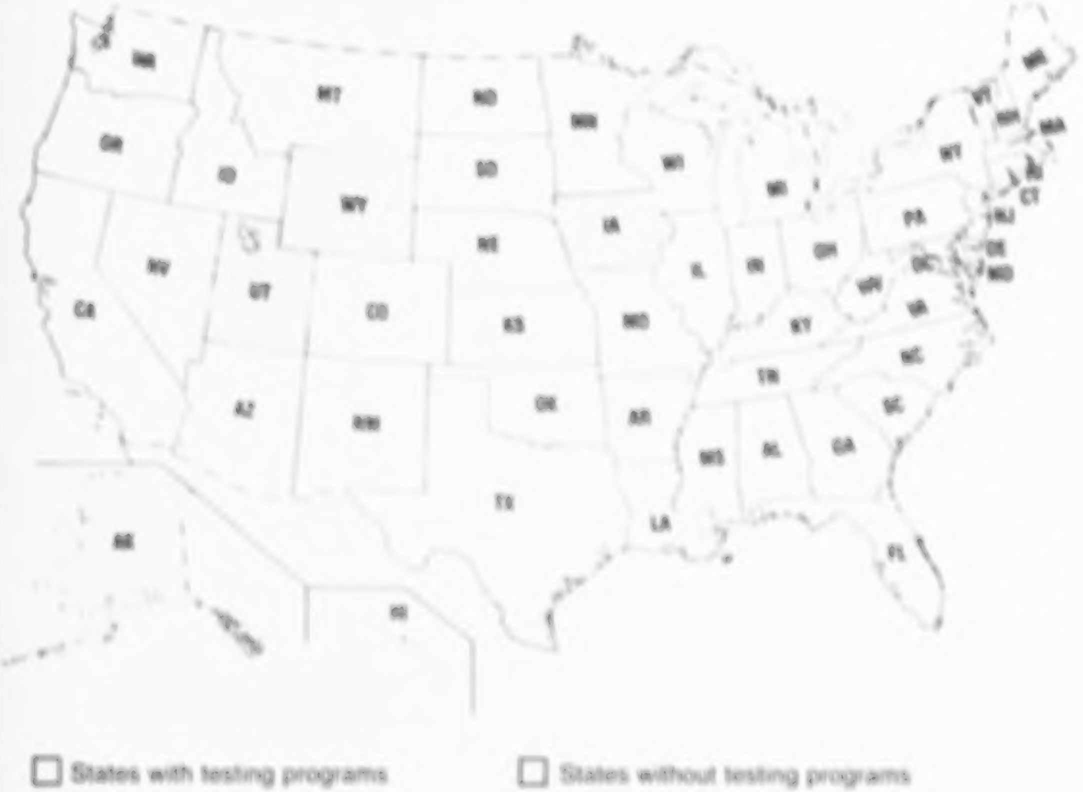
[1] Metropolitan Life Insurance Company and Louis Harris and Associates, *The American Teacher, 1986* (New York City: 1986).

[2] Carnegie Forum on Education and the Economy, *A Nation Prepared*, 1986.

SOURCES: Council of Chief State School Officers, *Education in the States, Volume 1*, 1987. Education Commission of the States; personal communication with the author. See also U.S. Department of Education, Office of Research, *What's Happening in Teacher Testing – 1987*, August 1987.

Chart 1:26.—States that have enacted testing programs for initially certifying teachers: Fall 1987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☐ States with testing programs
☐ States without testing programs

SOURCE: Office of Research, *What's Happening in Teacher Testing – 1987.* Education Commission of the States, personal communication with the author.

Introduction

Institutions of higher education are being challenged to prepare students to deal with the complex problems facing the country, including the demands of increasingly competitive world markets and long-term economic and technological growth. The growing emphasis on the need to evaluate what colleges teach and what college students study and learn is, at least in part, a response to these issues.

Colleges and universities also face pressure to curb increasing costs. Rising tuition levels have caused considerable concern about students' ability to afford a college education. As a result, there is growing public attention to how higher education institutions spend their money and how much they charge students in tuition and fees. Another major issue confronting these institutions concerns the enrollment of low income and minority students in higher education.

The indicators presented in this section provide information important to the public debate of these and related issues. This overview discusses them under the following four headings: (1) context; (2) outcomes; (3) college costs and financial resources; and (4) minority participation and degree attainment. The discussion is confined to material presented in the indicators.

Context

Enrollment and earned degree data provide information about the size and configuration of higher education. Changes in enrollment and degree attainment indicate changes in the demand for higher education and, therefore, in the use of different types of educational resources, such as programs of study, personnel, equipment, and buildings.

Enrollment: Enrollment in colleges and universities rose by 45 percent between 1970 and 1983, from 8.6 to 12.5 million students (*Indicator 2:16*). It dipped in 1984 but then turned upward again to reach an estimated all-time high in 1987. Growth was greatest in 2-year institutions, where enrollment more than doubled. Public institutions, which accounted for 77 percent of all higher education enrollment in 1987, increased enrollment at a faster pace than private institutions.

Decreases in the traditional college-age population have caused many analysts and college administrators to predict declining college enrollments for the 1980s and early 1990s. However, declining enrollments have not materialized to date. Despite shrinkage in the 18- to 24-year-old population, total enrollment in the Nation's colleges and universities was higher in 1987 than in 1980, partly because a larger percentage of this group chose to attend college (*Indicators 2:16* and *2:18*). An increase in the number of students aged 25 and older, mainly due to population growth, also helped avert a downward enrollment trend.

The composition of the student body has changed substantially since 1970 (*Indicator 2:17*). In that year, the typical college student was a male undergraduate between the ages of 18 and 24 attending full time. Between then and the mid-1980s, however, the proportion of older, female, and part-time students increased substantially. As a result, by 1987, the typical college student was a female undergraduate. And there has been an increasing probability that a student is over 25 and attending part time.

Degree attainment: The number of degrees awarded by American colleges and universities was nearly one-third higher in 1986 than in 1971 (*Indicator 2:3*). Growth patterns varied by type of degree. Associate degrees climbed during most of the period, accounting for 44 percent of total degree growth. Following a decline in the mid- to late 1970s, bachelor's degrees rose throughout the 1980s. The number of master's degrees awarded peaked in 1977 and then declined steadily until 1984, after which it turned upward. The number of doctor's degrees awarded remained generally stable throughout the period, but the number of first-professional degrees rose continually until 1986, when it dropped off slightly.

At both the baccalaureate and master's levels, there has been a shift over the last several years in the fields that students pursue (*Indicators 2:4* and *2:5*). The physical, biological, and social sciences, humanities, and education have become less popular. The reverse is true, however, for many occupationally oriented fields such as business and management, computer and information sciences, and engineering. The change in field of study preferences has been less pronounced and clear-cut at the doctor's level. (For further discussion of degrees awarded in the sciences and engineering, see *Outcomes: Education and the Economy*, below).

Outcomes

A general indicator of the country's knowledge and skill levels is the amount of higher education obtained by the population. Equally important are indicators of what students learn in college and whether that educational experience makes any difference in their lives and their performance as citizens and workers. As the cost of going to college has risen and international economic competition has increased, attention to the productivity, effectiveness, and objectives of the higher education system has grown. The indicators discussed in this section deal, in one way or another, with the issues of educational and economic outcomes, both for individuals and for the society as a whole.

Educational attainment: The proportion of the American young adult population (25- to 34-year-olds) with some college education rose by more than 50 percent during the 1970s and then remained level in the 1980s (*Indicator 2:2*). In 1987, close to one-half of the young adults had attended college for at least 1 year and about one-fourth had finished 4 or more years.

Student achievement: National data comparing the knowledge and skills of students as they enter and then as they graduate from college are not available. Thus, it is not possible to measure directly the educational effectiveness of the college experience. Still, data from the graduate record examinations (GRE), which measure the achievement of a large but select group of college graduates applying to graduate and professional schools, provide some insight into this matter. Data on functional literacy from the National Assessment of Educational Progress (NAEP) also provide clues to what college students and graduates know.

Indicator 2:1 displays GRE scores on general verbal and quantitative tests and on 14 subject area tests from 1964 to 1987. Student performance in scientific and technical fields is of particular interest because of increasing international competition in these fields. Over the long term (1964–1987), performance in mathematics showed a large degree of improvement, but scores for most other scientific and technical fields remained largely unchanged. More recently (1976–1987), improvement in mathematics performance has slowed and achievement in physics has declined. Engineering and quantitative skill scores, however, have improved. In nonscientific/technical areas, scores declined across the board between 1964 and 1987. The more recent trend (1976–1987) shows a slowing of the rate of decline and, in some cases, a reversal.

Functional literacy skills include the knowledge and skills needed to understand or use textual material, such as news stories, and technical documents, such as tables and maps, and to apply basic arithmetic operations to such tasks as balancing a checkbook and calculating interest on a loan. While it may not be higher education's role to teach these skills, it is instructive to look at how well college students and graduates have acquired them. NAEP data for 1985 on 21- to 25-year-olds suggest that more literate students may persist in college and that the last 2 years of college do not contribute to an increase in functional literacy skills (*Indicator 2:12*). They also show that many college graduates cannot perform upper-level literacy skills such as stating in writing an argument made in a newspaper column.

Post-college earnings and activities: Insights into the influence of education on the lives of individuals are obtained partly by looking at what college graduates do shortly after graduation and how the earnings of college- and high-school-educated workers differ. Data on the activities of 1980 and 1984 bachelor's degree recipients approximately 1 year after graduation show that field of study is related to the choices graduates make between employment and further study. A much higher proportion of the graduates in technical/professional fields (engineering, business, health, education, and public affairs and social services) than in the arts and sciences were employed full time (*Indicator 2:6*). Conversely, a much higher proportion of arts and sciences graduates were enrolled in school.

Numerous studies have examined the effect of education on individuals' labor force behavior and earnings. While educators disagree about the nature and size of that effect, most agree that there is a link between the amount of education people have and their success in the labor market. *Indicator 2:8* shows that, among young adults working full time, year-round, the college-educated earned more each year from 1978 to 1987 than those with only a high school education, regardless of race or sex. The earnings advantage was greater for those with 4 or more years of college than for those with fewer years, an advantage that generally became larger during the period.

Education and the economy: Colleges and universities contribute to the Nation's economic development by conducting scientific and technological research and by training the workforce. Data on research and development (R&D) expenditures at higher education institutions and degrees earned by field of study provide valuable information about trends in the size of that research contribution and the training of scientists and engineers.

Research and development expenditures at doctorate-granting institutions constituted about 9 percent of total national R&D expenditures in 1986 (*Indicator 2:7*). Inflation-adjusted R&D expenditures at these institutions, which spend nearly all of the R&D funds available to higher education, grew substantially from 1972 to 1986, generally in line with growth in the total national R&D effort.

Continued R&D growth depends upon the availability of highly trained scientific and technical manpower. Between 1971 and 1986, the number of bachelor's and master's degrees awarded in the natural sciences (physical, biological, and computer sciences combined) increased (*Indicators 2:4 and 2:5*). The increase was entirely the result of tremendous growth in the computer sciences. In addition, engineering became much more popular during the period, with the rate of degree growth in this field far outpacing growth in total degrees.

At the doctoral level, where research scientists and college faculty are trained, the number of degrees awarded in the natural sciences and in engineering decreased 15 and 6 percent, respectively, between 1971 and 1986 (*Indicator 2:5*). There is evidence of a recent halt or turnaround in this downward movement, though. In engineering, the number of earned degrees has increased steadily since 1978. Also, earned degrees in the natural sciences, although still substantially below 1971 levels, increased some in the 1980s.

The decline in the number of doctor's degrees awarded by American colleges and universities in scientific and technical fields would have been greater had it not been for the increasing presence of foreign students. While the number of U.S. citizens and resident aliens specializing in these fields at the doctoral level dropped between 1977 and 1985, the number of foreign students grew (*Indicator 2:9*). For example, the number of foreign students receiving degrees in the physical and biological sciences increased 26 percent, whereas the number of American recipients declined 2 percent. The influx of foreign students has been important in engineering as well, accounting for 92 percent of the growth.

The foreign student presence in the natural sciences and engineering has also been felt at the bachelor's and master's levels. The number of such students earning physical and biological science degrees increased between 1977 and 1985, whereas the number of Americans declined. Both groups earned more computer science and engineering degrees, but foreign students accounted for 7 percent of the growth at the bachelor's level and 40 percent at the master's level.

The declining interest of American students in basic scientific fields has created considerable concern about the country's ability to remain scientifically and technologically competitive. The fear is that an insufficient number of Americans are being trained to replace an aging scientific workforce in higher education, industry, and government.

The extent to which this is a problem depends partially on whether foreign students graduating from U.S. schools remain in this country to work after completing their degrees. Data on the post-degree plans of new foreign doctorate recipients suggest that many of them take jobs or pursue postdoctoral study here, and that the proportion doing so has increased in the last several years (*Indicator 2:9*). In 1986, 37 percent of all foreign doctoral students receiving degrees in the natural sciences and engineering had specific plans to work or study in the United States, at least temporarily. Only 26 percent had had such plans 10 years earlier.

College Costs and Financial Resources

Current concerns about the financing of higher education have focused on several interrelated issues pertaining to tuition levels, expenditures, and revenue sources. The following questions are among those being asked: Have colleges relied more and more on tuition and fees as a source of revenue? What proportion of expenditures is spent on instruction and research as opposed to other functions, such as administration? Have faculty salaries, an important component of instructional expenditures, kept pace with inflation? Several indicators in this volume address these questions and thus provide insights into the nature and magnitude of trends in the price and costs of higher education.

Tuition charges: Following declines in the late 1970s, average undergraduate tuition charges, adjusted for inflation, rose sharply at all types of public and private institutions, particularly the latter, during the first half of the 1980s (*Indicator 2:14*). At private institutions, tuition increases were accompanied by substantial growth in expenditures for scholarships and fellowships. In fact, for the 1977–1986 period as a whole, these expenditures grew proportionately more than tuition and fees.

Institutional revenues and expenditures: Higher education revenues, after accounting for inflation, were substantially higher in 1986 than in 1976 (*Indicator 2:13*). Growth occurred throughout the 10-year period at private institutions but mainly after 1984 at public ones. Over the period, the relative importance of different revenue sources remained about the same at both public and private institutions. Private institutions were heavily dependent on tuition and fees. In 1986, like 10 years earlier, a little more than one-half of the revenue at private 4-year institutions and two-thirds at private 2-year institutions came from this source. Public institutions depended much less heavily on tuition and fees, instead relying primarily on State and local government appropriations for the bulk of their revenues.

With few exceptions, all types of expenditures per full-time-equivalent (FTE) student, after accounting for inflation, were higher in 1986 than in 1977. This was true at all types of public and private colleges and universities (*Indicator 2:14*). Much of the increase occurred in the mid-1980s. Administrative expenses, up sharply, especially at private institutions, increased proportionately more than instructional expenses. Expenditures for research, an important function of higher education, were higher in 1986 than in 1977 at both public and private universities and other 4-year institutions, particularly public ones. At private universities, however, these expenditures had dropped dramatically through the late 1970s and early 1980s and only recently have exceeded 1977 levels. A similar, though less-pronounced and clear-cut, trend occurred at private 4-year institutions other than universities.

Inflation-adjusted faculty salaries for all professorial ranks, an important component of higher education costs, declined substantially from 1973 to 1981 at all types of public and private institutions (*Indicator 2:15*). Between the early 1980s and 1986, the latest year for which data are available, these salaries climbed steadily upward, but not enough to compensate for earlier losses.

Minority Participation and Degree Attainment

There is considerable debate about higher education's success in reaching out to racial and ethnic minorities. Indicators of racial/ethnic similarities and differences in college participation and completion rates, degree attainment, and field of study are important to the debate.

Following increases in the early to mid-1970s, the proportion of black and Hispanic 18- to 24-year-olds enrolled in higher education dropped somewhat and then leveled off through the mid-1980s (*Indicator 2:19*). Reflecting earlier growth in the participation rates of 18- to 24-year-olds, minority young adults—those 25 to 34 years old—have become better educated (*Indicator 2:2*). Through much of the 1970s and into the early 1980s, growing proportions of young adult blacks and Hispanics had attended college for at least 1 year and had completed 4 or more years. White young adults also experienced educational gains over the period, but their college completion rates grew proportionately less than the rates of blacks and Hispanics. Still, whites remain much more likely than the others to attend and finish college.

Despite growing college-age and young adult populations and stable participation rates, blacks earned fewer bachelor's and advanced degrees in 1985 than in 1977 (*Indicator 2:10*). Men accounted for most of the decline. Although fewer black women earned master's degrees in 1985 than in 1977, they earned more bachelor's, doctor's and first-professional degrees, particularly the latter.

Hispanics earned more degrees in 1985 than in 1977 at all levels. The increases were generally in line with their population growth. Asians and American Indians also earned more degrees at all levels, but whites earned fewer at the master's and doctor's levels.

Students' fields of study can influence the type of jobs they get and the amounts they earn. *Indicator 2:11* shows substantial differences in field preferences by race and ethnicity. The most pronounced field of study differences in 1985 as well as

1977 occurred in preferences for the natural sciences and engineering and for education. Natural sciences and engineering, already the most popular fields among Asians, grew even more popular with them between 1977 and 1985. These fields accounted for 42 percent of the bachelor's degrees earned by Asians in 1985, 35 percent of the master's degrees, and 56 percent of the doctor's degrees. Much smaller proportions of other racial/ethnic groups received degrees in these fields. They were about equally popular among whites, blacks, Hispanics, and American Indians, except at the doctoral level, where smaller proportions of blacks and American Indians specialized in them.

Education was by far the most popular field at the master's level among non-Asian minorities in both 1977 and 1985. Although it declined substantially in popularity between those years, it accounted for about 4 out of every 10 master's degrees earned in 1985 by blacks, Hispanics, and American Indians. At the doctoral level, education degrees constituted by far the greatest portion of total degrees earned by blacks and American Indians. Close to 45 percent of the doctoral degrees earned by these groups were in education compared with about 25 percent earned by whites and Hispanics and 8 percent by Asians.

Conclusion

The indicators presented in this volume, while not providing a comprehensive picture of higher education, furnish important insights into the condition of the system. On the positive side, the system continued to grow in size and diversity in the 1980s. Enrollments increased despite a decline in the traditional college-age population. The total number of degrees and the number awarded to racial and ethnic minorities, except blacks, also increased. A college education continued to make an important difference in workers' earnings. Research and development expenditures at academic institutions grew considerably. And faculty salaries recaptured some of their earlier losses in purchasing power.

Some less encouraging trends have also occurred in higher education in the 1980s. Tuition increased substantially, as did most types of higher education expenditures. Fewer Americans earned degrees in scientific and engineering fields, while the foreign student presence in these fields, especially at the graduate level, grew. These trends have created concern about the country's ability to replace an aging scientific workforce and to remain competitive internationally. Finally, despite population growth and stable participation rates, the number of degrees earned by black Americans decreased at all degree levels, except the first-professional, with the largest decrease at the master's level.

Indicators are a valuable tool in monitoring these and other trends in higher education. Indicator development work will continue in order to fill information gaps and address new policy issues. Several new periodic surveys are in progress at the National Center for Education Statistics. These surveys will provide valuable baseline and trend data in a number of areas where little or no data currently exist. These areas include: enrollment in all postsecondary institutions; student financial-aid packaging; levels of student education-related debt; and staffing patterns at higher education institutions. The availability of these data will permit the development of new indicators in the future that will result in a much broader and more complete picture of the condition of postsecondary education.

Indicator 2:1 College student achievement: Selected short-term and long-term trends

- **Achievement among college graduates, as measured by tests for admission to graduate school programs, has declined over the long-term (over 20 years), particularly in social sciences and humanities.**
- **More recent trends (10 years), however, show some improvement, most notably in the professional fields of engineering and education.**

Since the publication of several national reports on the quality of American higher education in 1984 and 1985, there has been growing interest in measuring the academic achievement of college students.* At least eight States have initiated assessment programs in their public institutions of higher education, and an equal number of States are developing similar programs. National data are available from the various tests taken by students in the process of applying to graduate and professional schools. Of these, only the Graduate Record Examinations (GRE) offer the potential for historical comparisons.

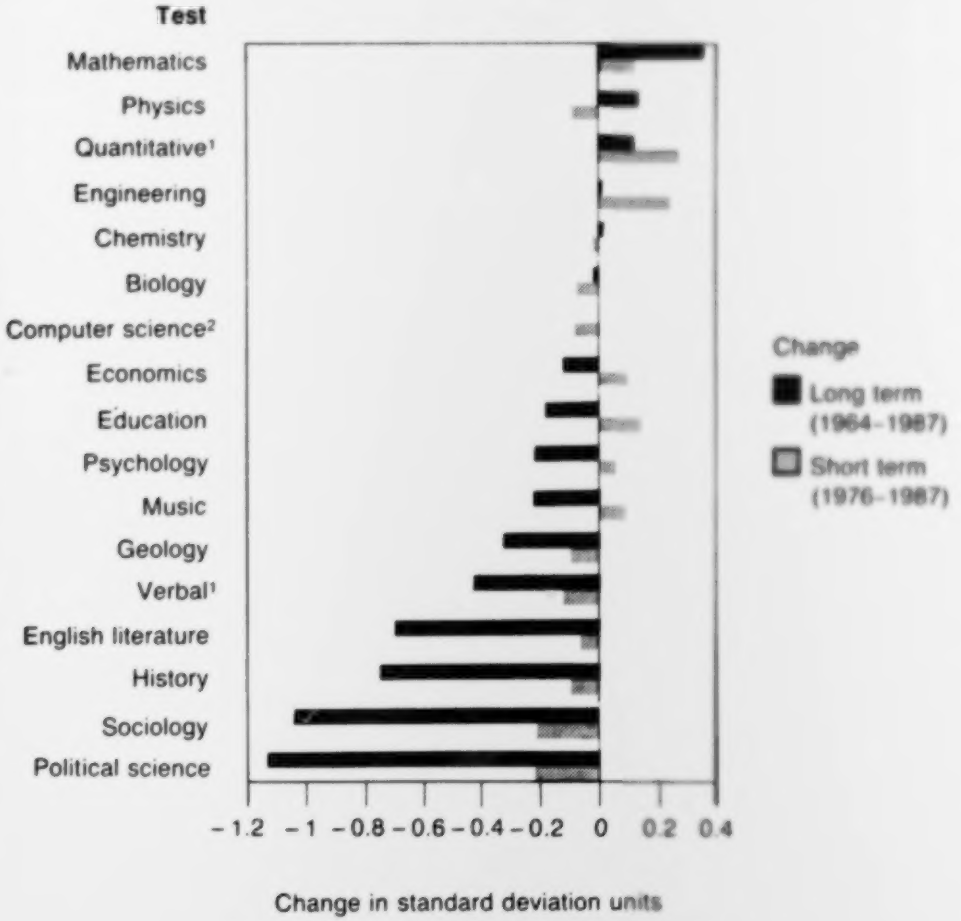
The accompanying chart presents both the long-term and recent trends in student performance on selected GRE tests. The changes are expressed in Standard Deviation Units, a measure that makes achievement scores more comparable across the years and by type of test than do average scores. Over the long term (1964–87), only performance in mathematics showed a large degree of improvement, while scores for most other scientific and technical fields remained unchanged. Achievement declined in education and in the humanities and social sciences. Essentially, the greatest declines occurred in subjects requiring high verbal skills.

The more recent trend in test scores (1976–87) presents some encouraging divergences, particularly in view of the increased number of test-takers since 1980. The rate of decline has slowed or reversed in education, in the overall verbal test, and in most other fields that exhibited moderate or extreme long-term declines.

These data should not be interpreted as indicators of the overall quality of higher education in the United States. In general, they reflect the performance of a self-selected, though large, group of test-takers whose educational aspirations are higher than most of their peers.

SOURCE: U.S. Department of Education, Office of Research, *The Standardized Test Scores of College Graduates, 1964–1982*, 1985; and special tabulations.

Chart 2:1.—Long-term and short-term changes in performance on Graduate Record Examinations: 1964–1987



[1] Quantitative and Verbal examinations are general examinations. All others are subject area tests.

[2] Tests began in 1976.

NOTE: A change in the range of -0.10 to +0.10 is really no change. Changes exceeding -0.4 or +0.4 are large.

SOURCE: Office of Research, *The Standardized Test Scores of College Graduates, 1964–1982*, 1985, and special tabulations.

Indicator 2:2 Trends in higher education attainment

- **The proportion of young adults (25- to 34-years old) with some college education rose more than 50 percent during the 1970s, and then remained level in the 1980s.**
- **In 1987, nearly 5 out of 20 young adults had completed 4 or more years of college, while more than 7 of 20 had completed at least 2 years and about 9 of 20 had completed at least 1 year.**

The Nation's educational growth has an impact on its social and economic life, affecting the welfare of individuals, families, and the Nation as a whole. Trends in college attendance and completion rates indicate changes in the educational level of the country's workforce and thus provide clues to current and future socioeconomic conditions.

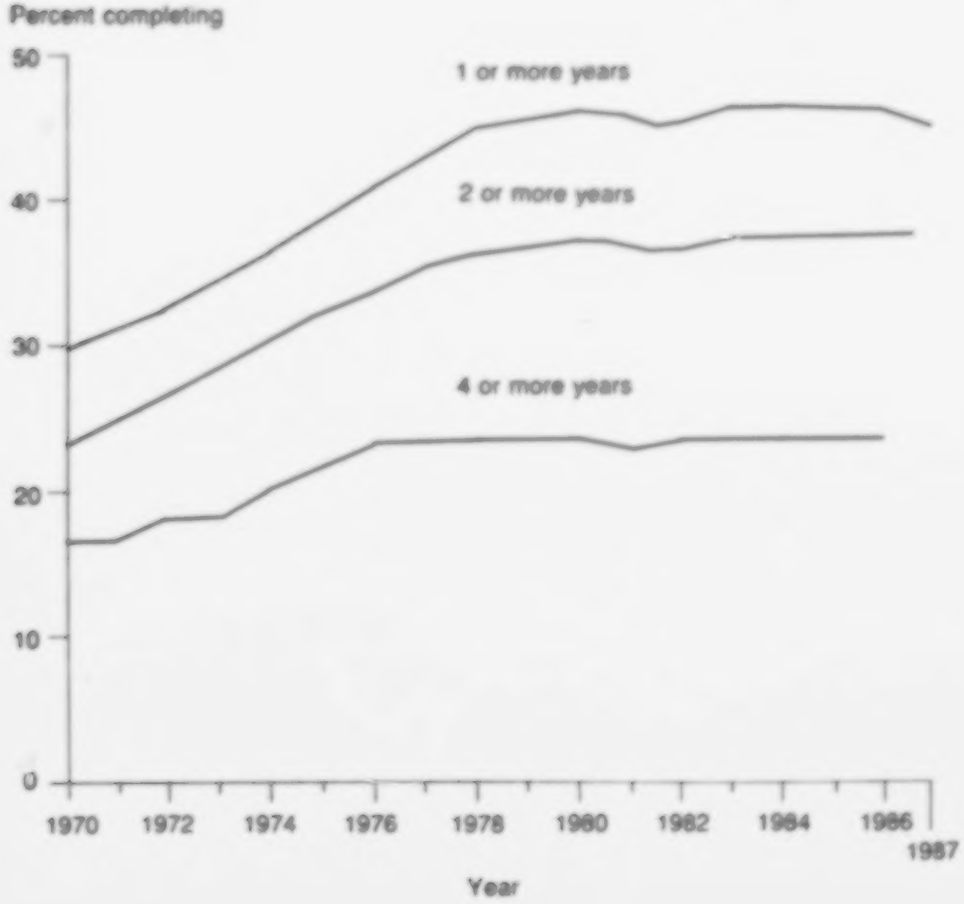
The considerable growth in educational attainment of the population 25- to 34-years old is shown below.

	Years of college attended		
Year	1 or more	2 or more	4 or more
		Percent	
1970	30	24	16
1975	39	32	21
1980	46	38	24
1987	45	38	24

Between 1970 and 1979, the proportion of black young adults who attended college doubled. (Those who had attended for at least 1 year increased from 15 to 31 percent, and those who had completed 4 or more years increased from 6 to 13 percent.) During the same period, the percentage of white young adults who had attended college also increased, but at a slower rate than that of blacks. Despite their gains, blacks are still less likely to attend college and, if they do attend, are less likely to complete 4 years than are whites.

SOURCE: U.S. Department of Commerce, Bureau of the Census, "Educational Attainment in the United States," various years, *Current Population Reports*, Series P-20; and unpublished tabulations from the March supplement to the Current Population Survey.

Chart 2:2.—Trends in the number of years of college completed by 25- to 34-year-olds: 1970–1987



SOURCE: Bureau of the Census, *Current Population Reports*, various years.

Indicator 2:3 Degrees conferred, by level

- **Degrees granted by American colleges and universities at all levels increased by 31 percent between 1971 and 1986.**
- **Associate degrees showed the greatest absolute rise, increasing by 193,000, or 77 percent, during this period.**

Trends in the number of degrees conferred provide a sense of the productivity of the Nation's system of colleges and universities and provide clues to the level of trained individuals in the society. In the last 15 years, the number of degrees awarded annually rose from 1.4 million to 1.8 million, but the numbers and relative growth at each level contrasted substantially, reflecting changing interests and educational goals of students as well as changing needs of prospective employers.

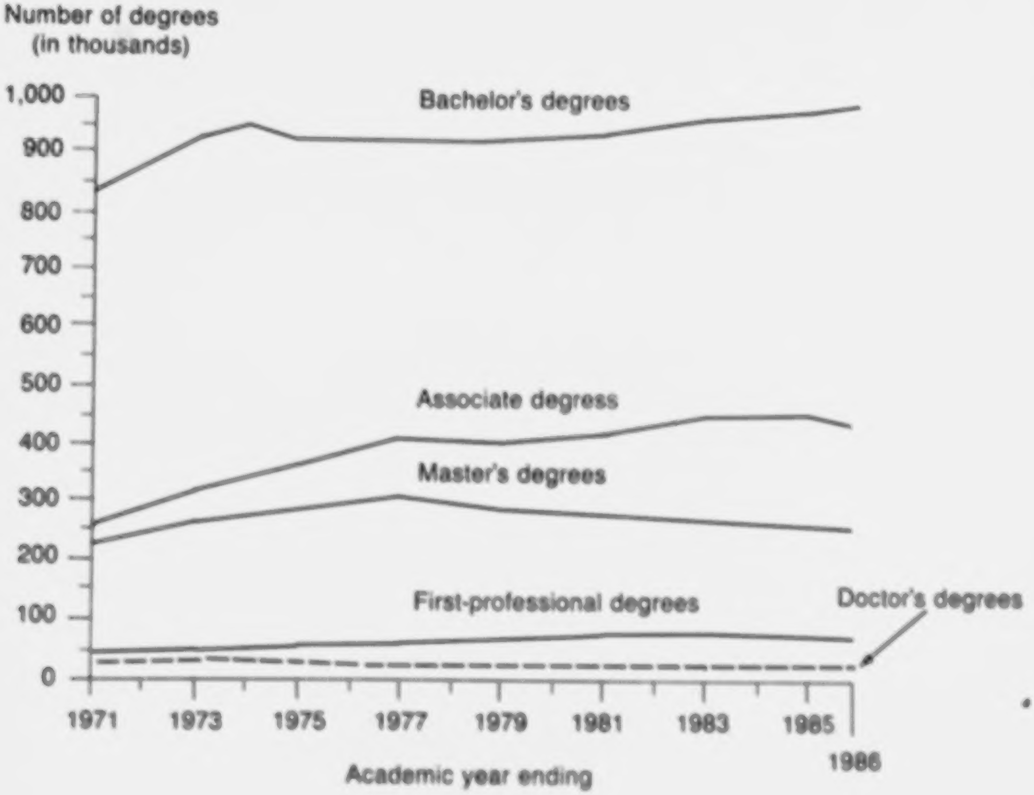
Between 1971 and 1986, the number of bachelor's degrees conferred rose from nearly 840,000 to nearly 988,000, but this growth was not steady. The number of degrees had climbed to almost 946,000 in 1974, but this rise was followed by a period of declining numbers until 1980, when a steady upswing began. The number awarded in 1986 represented an all-time high. Nevertheless, because of greater relative growth at other levels, bachelor's degrees accounted for only 54 percent of all degrees conferred that year, a drop from 60 percent in 1971.

Associate degrees conferred, in rising from 253,000 to 446,000 during the period, increased their percentage of the total from 18 to 24 percent. Similarly, by nearly doubling the number of degrees granted, the first-professional level also increased its proportion of the total, going from 2.7 to 4.0 percent (38,000 to 74,000 awarded). While Master's degrees, as a proportion of the total, declined from 17 to 16 percent, their absolute numbers increased form 231,000 to 289,000 over this period. Doctor's degrees changed very little in number, varying from a low of 32,000 in 1971 to a high of 35,000 in 1973. Their share of the total declined from 2.3 to 1.8 percent.

While the number of bachelor's degrees awarded in 1986 was the greatest to date, the number of degrees at other levels that year represented declines from previous highs. Associate degrees fell 2.3 percent after 1983 and first-professional degrees 1.5 percent after 1985. There were 9 percent fewer master's degrees in 1986 than in 1977 and 3 percent fewer doctorates than in 1973.

SOURCE: U. S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1988* (based on the HEGIS survey Degrees and Other Formal Awards Conferred, various years).

Chart 2:3.—Trends in the number of degrees awarded at colleges and universities, by level: Academic years ending 1971–1986



SOURCE: U.S. Department of Education, National Center for Education Statistics, Degrees and Other Formal Awards Conferred surveys, various years.

Indicator 2:4 Bachelor's degrees conferred, by field

- **The number of bachelor's degrees awarded in the arts and sciences fell by 75,000 between 1970–71 and 1985–86, while the number of technical and professional degrees rose by 224,000.**
- **Technical and professional degrees increased from 50 percent of all degrees conferred in academic year 1970–71 to over 65 percent in 1985–86.**

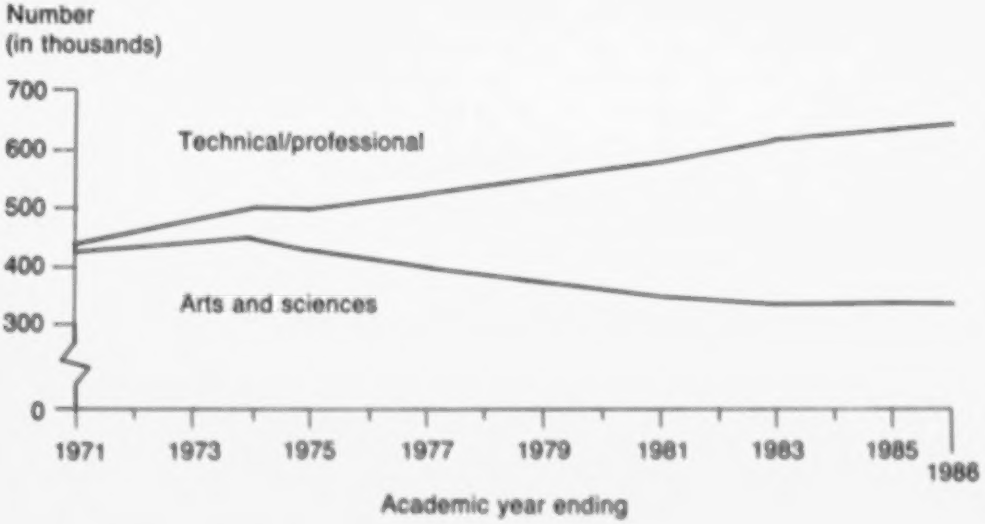
Over the years, students have tended to shift the emphasis of their studies away from some fields and toward others. Such shifts, reflected in the numbers of bachelor's degrees awarded in particular fields, can profoundly affect demand for courses and the supply in various job markets. For this reason, employers seeking job applicants, college administrators planning future programs, analysts tracking employment trends, and others keenly follow the trends in bachelor awards.

In recent years, the proportion of students receiving bachelor's degrees in the traditional arts and sciences has declined generally, although a small upturn occurred in 1985–86. This decline has been heavily concentrated in the social sciences (including psychology), where the number of degrees has fallen by 59,000 (30 percent) since 1970–71. The number of physical and biological sciences degrees (including mathematics) dropped by 5,000 (7 percent), and humanities degrees declined by 11,000 (8 percent).

During the same period, the number of degrees awarded in several other fields rose: business by 123,000 (107 percent), computer and information sciences by 40,000 (1,654 percent), and engineering and engineering technologies by 46,000 (92 percent). These increases were partially offset by an 89,000 (51 percent) decline in the number of education degrees conferred.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1988* (based on the HEGIS survey Degrees and Other Formal Awards Conferred, various years).

Chart 2:4.—Trends in the number of bachelor's degrees conferred, by field: Academic years ending 1971–1986



SOURCE: Center for Education Statistics, *Digest of Education Statistics, 1988.*

Indicator 2:5 Advanced degrees conferred, by field

- **In the past decade, the distribution of master's degrees by field has changed markedly; degrees in education have fallen dramatically, while those in business have increased greatly.**
- **At the doctoral level, the number of degrees in engineering and the physical and biological sciences has declined, while the number in most other fields has increased.**

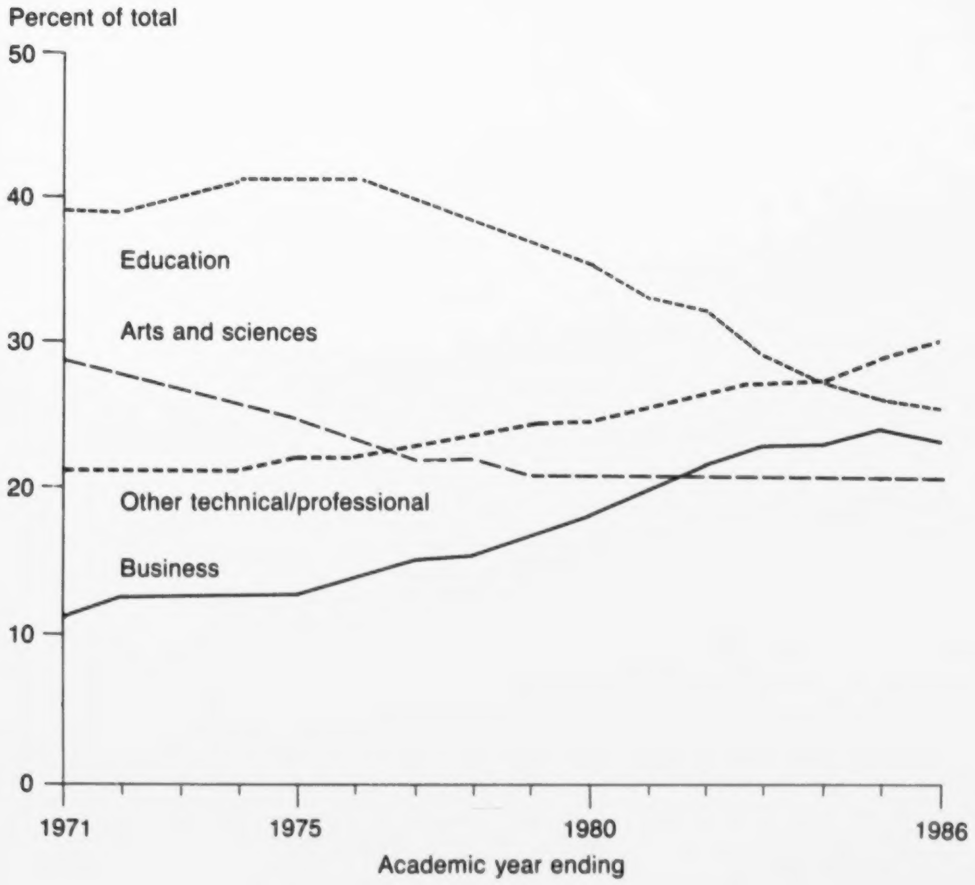
Trends in students' fields of concentration can provide important information on changing student interests and on students' responses to changing labor markets. They may also provide clues about ongoing or future changes in the demand for faculty in different disciplines.

Since academic year 1976–77, a peak year for the total number of master's degrees awarded, degrees in arts and sciences have declined 15 percent. This decline has been experienced by all three broad sectors of the arts and sciences—physical and biological sciences, social sciences, and humanities. At the same time, the number of master's degrees in the technical/professional area has decreased 7 percent, but this decline has not been uniform among the technical/professional fields. While the number of degrees in education was dropping 40 percent, the total degrees awarded in the other technical/professional fields were increasing by 27 percent. Master's degrees in business rose by 45 percent and those in engineering by 33 percent. Although the percentage of degrees in education has declined while degrees in other technical/professional fields have increased, education remains the largest single field of study at that level, accounting for over one quarter of all degrees.

The total number of doctor's degrees conferred annually changed very little between 1971 and 1986. However, while the number of degrees in most fields (social sciences, humanities, business, and education) increased, there were significant declines in engineering and the physical and biological sciences. Engineering degrees declined by 6 percent, life sciences by 8 percent, physical sciences by 19 percent, but doctoral degrees in mathematics dropped by 38 percent.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1988* (based on the HEGIS survey Degrees and Other Formal Awards Conferred, various years).

Chart 2:5.—Trends in the percent of master's degrees conferred, by selected field: Academic years ending 1971–1986



SOURCE: National Center for Education Statistics, Degrees and Other Formal Awards Conferred survey, various years.

Indicator 2:6 Activities of recent college graduates

- **Approximately 1 year after obtaining a bachelor's degree, the proportion of graduates working full-time was substantially greater for technical/professional majors than for arts and science majors.**
- **Arts and science majors were more often enrolled in school (of all types) and not working full-time than were technical/professional majors.**
- **Graduates in 1980 and 1984 displayed similar patterns of work and postsecondary enrollment.**

What college graduates do shortly after graduation is one measure of the outcomes of higher education. It may also indicate the characteristics and objectives of the undergraduate curriculum. Undergraduate majors in certain fields typically pursue more formal education before taking full-time work. Other fields, offering specific job-related training, show much higher levels of employment immediately after graduation.

The National Center for Education Statistics surveyed two groups of college graduates 1 to 2 years after receiving their bachelor's degrees. Graduates of 1979–80 were surveyed in 1981, and graduates of 1983–84 were surveyed in 1985. Two trends emerged:

– graduates in technical/professional fields (engineering, business, health, education, and public affairs and social services) had higher rates of employment but lower rates of school enrollment than graduates of arts and science fields; and

– little change in either area has occurred over this time period.

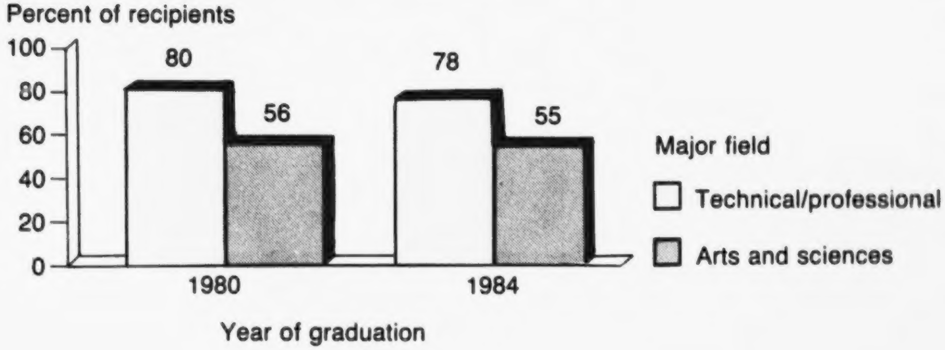
One fourth of all arts and science majors were enrolled in school and not working full-time 1 or 2 years after graduation. This proportion approximately tripled that of undergraduate majors in technical/professional fields with the same pattern of work and study activities.

More than one half (55 percent) of all arts and science majors were employed full-time 1 or 2 years after receiving their bachelor's degrees in 1983–84. This proportion was considerably lower than the 78 percent full-time employment rate for undergraduate majors in the technical/professional fields during the same time period after graduation.

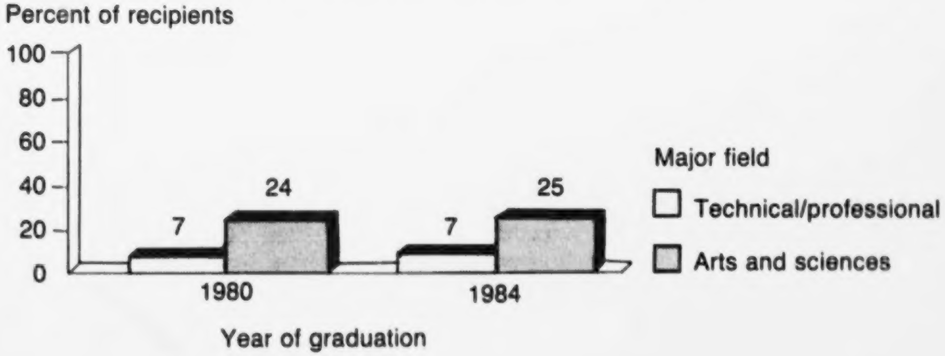
SOURCE: U.S. Department of Education, National Center for Education Statistics, Recent College Graduates Survey, various years, unpublished tabulations.

Chart 2:6.—Activities of recent bachelor's degree recipients, by major field and year of graduation: Academic years ending 1980 and 1984

Graduates working full time



Graduates enrolled, not working full time



SOURCE: National Center for Education Statistics, Recent College Graduates survey, various years.

Indicator 2:7 Higher education spending on research and development

- **Doctorate-granting institutions spent substantially increasing amounts on research and development (R&D) between fiscal years 1972 and 1986, after accounting for inflation.**
- **These institutions' share of total U.S. spending on R&D remained the same in 1986 as in 1972 (9 percent).**
- **The Federal government remains the primary source of R&D expenditures at academic institutions, but its role has declined somewhat.**

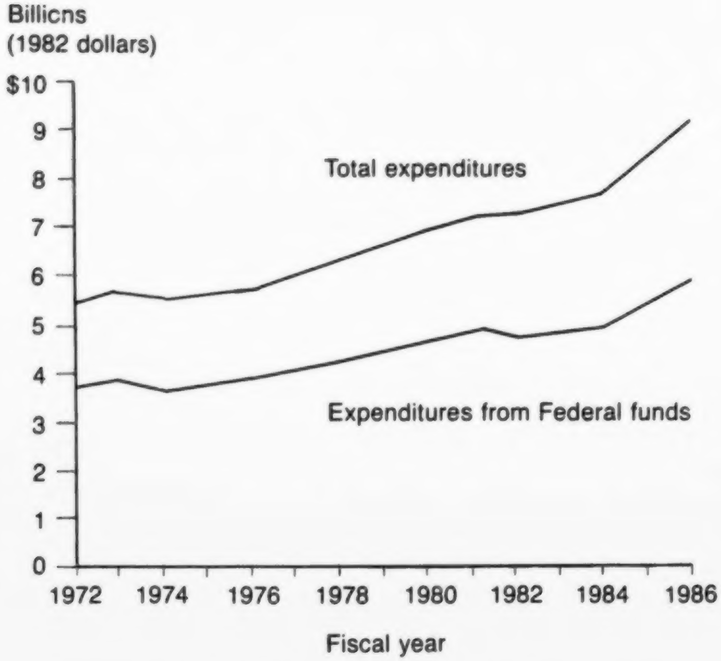
The Nation's institutions of higher education are an important source of new scientific and technological knowledge. Much of this knowledge comes from doctorate-granting institutions, which spend nearly all the R&D funds available to higher education. The condition of the R&D effort at those institutions is therefore viewed by many as vital to the Nation's economic health and its competitiveness in world markets.

Between fiscal years 1972 and 1986, constant dollar R&D expenditures at doctorate-granting institutions increased by two-thirds. Growth occurred throughout most of the period, with a slight decline in 1974 and a slowdown in the early 1980s. For the period as a whole, it paralleled growth in the total national R&D effort, with academic R&D expenditures remaining at about 9 percent of the total. As a proportion of the gross national product (GNP), academic R&D expenditures were at about the same level (about 0.2 percent) throughout the period.

Federal funds remain by far the largest source of academic R&D expenditures and increased during the 1972-86 period by over 50 percent after inflation. Still, the relative importance of Federal funds dropped and institutions shifted to a greater reliance on industry and institutional funds. Federal funds constituted 62 percent of the R&D expenditures at doctorate-granting institutions in 1986, down from 68 percent in 1972. Funds from State and local governments also declined as a percent of the total during this time. Industry funds, however, increased from 3 to 6 percent and institutional funds from 12 to 17 percent of the total.

SOURCE: National Science Board, *Science Indicators: The 1985 Report*, 1985. National Science Foundation, *Early Release of Summary Statistics on Academic Science/Engineering Resources*, October 1987 (based on Scientific and Engineering Expenditures at Universities and Colleges survey, various years).

Chart 2:7.—Trends in research and development expenditures at doctorate-granting institutions: Fiscal years 1972–1986



Source: National Science Foundation, Scientific and Engineering Expenditures at Universities and Colleges survey, various years.

Indicator 2:8 Earnings of young adults, by educational attainment

- **Among young adults working full-time, year-round, the college-educated generally earned more annually during the 1978–87 period than those who had completed only 4 years of high school, regardless of race or sex.**
- **The earnings advantage of the college-educated was more pronounced among those who had completed 4 or more years of college than among those who had only completed 1–3 years.**

Numerous studies have examined the effect of education on an individual's earnings potential.[1] There is considerable disagreement about how education affects earnings, how big that effect is, and the influence of other factors, such as innate ability and socioeconomic status. Still, most agree that there is a link, whether direct or indirect, between the amount of education one receives and one's earnings.

From 1978 to 1987, college-educated young adults, regardless of race or sex, earned more than young adults with only a high school education.[2] This earnings gap was greater for those who had completed 4 or more years of college than for those who had only completed 1–3 years. To illustrate, in 1987, whites with 4 or more years of college earned 41 percent more than whites with 4 years of high school, whereas those with 1–3 years of college earned only 16 percent more. These findings are in line with those of a recent Bureau of the Census study showing that, in 1984, highly educated people generally earned more than less-educated people.[3]

The earnings advantage of college-educated young adults with at least 4 years of college generally grew larger as the 1978–87 period progressed. This upward trend was most pronounced among women and occurred among blacks only during the latter part of the period.

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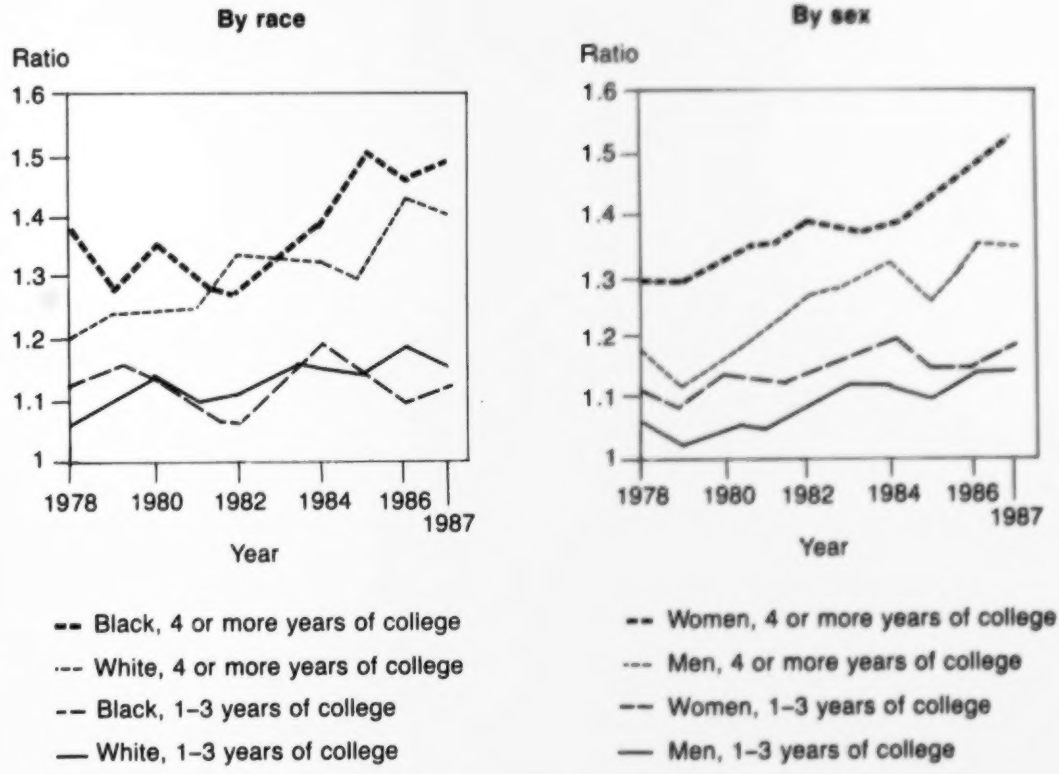
[1] Gordon K. Douglass, "Economic Returns on Investments in Higher Education," in Howard R. Bowen (ed.), *Investment in Learning: The Individual and Social Value of American Higher Education* (Washington, D.C.: Jossey-Bass Publishers, 1977), 359–387.

[2] The young adults discussed here were 25- to 34-year-old black, white, male and female full-time, year-round workers.

[3] U.S. Department of Commerce, Bureau of the Census, "What's It Worth? Educational Background and Economic Status: Spring 1984," *Current Population Reports.* Series P-70, No. 11. (Washington, D.C., 1987).

SOURCE: U.S. Department of Commerce, Bureau of the Census, Current Population Survey, March of various years, unpublished tabulations.

Chart 2:8.—**Trends in the ratio of earnings of persons with 1–3 and 4 or more years of college to those with 4 years of high school, by race and sex (full-time, year-round workers 25 to 34 years old): 1978–1987**



SOURCE: Bureau of the Census, Current Population Survey, March of various years, unpublished tabulations.

Indicator 2:9 Degrees earned by foreign students

- **From 1977 to 1985, foreign students earned an increasing proportion of the bachelor's and graduate degrees awarded by American colleges and universities.**
- **The presence of foreign students is most pronounced at the master's and doctor's levels, particularly in the natural sciences and engineering, where they earned about 1 out of every 4 degrees in 1985.**

The size of the foreign student population in the Nation's colleges and universities is significant for several reasons. It can affect enrollment levels and in turn influence the use of material, personnel, and financial resources, both the amount used and how they are allocated. It may also affect U.S. economic competitiveness, depending on whether students stay in this country to work or conduct postdoctoral research or whether they return to their homelands.

Between academic years 1976–77 and 1984–85, the number of foreign students[1] graduating from American institutions rose substantially at all degree levels. Much of this increase occurred in the natural sciences and engineering,[2] but considerable growth took place in nonscientific fields as well. In contrast to foreign students, the number of Americans receiving master's and doctor's degrees declined and the number receiving baccalaureate degrees increased comparatively little.

An important question in assessing the economic impact of foreign students is whether they return to their countries after receiving their degrees or remain in this country for further study or work. Of those earning doctorates in the natural sciences and engineering in 1986, over one-third had definite plans to stay in the United States at least temporarily.[3] Just over one-fourth had such plans 10 years earlier. Of those planning to stay in this country in 1986, about 4 in 10 had jobs and 6 in 10 planned to pursue postdoctoral study.

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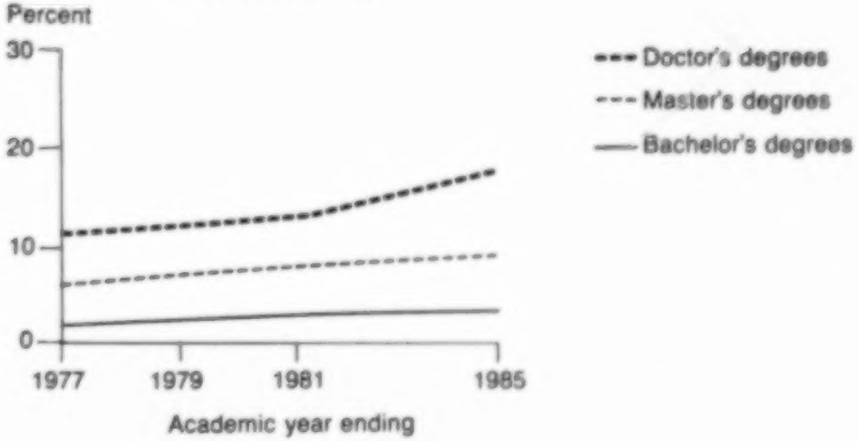
[1] As used here, the term "foreign students" refers to "nonresident aliens," that is, to non-U.S. citizens holding temporary visas.

[2] Physical and life sciences, mathematics, computer and information sciences, and engineering.

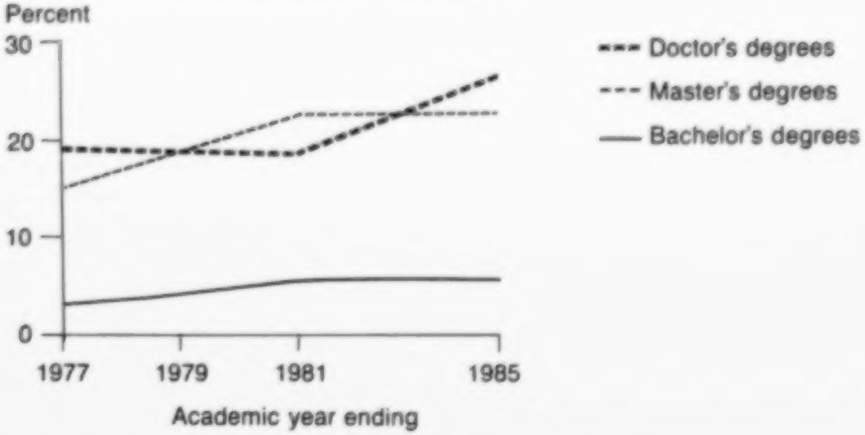
[3] Information on post-graduation plans is only available for doctorate recipients.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics*, 1980, 1982, 1987, and 1988 editions (based on the HEGIS survey Earned Degrees Conferred, various years). National Science Foundation, Survey of Earned Doctorates, various years, unpublished tabulations.

Chart 2:9.—Trends in the percent of degrees earned by foreign students in United States colleges and universities: Selected academic years ending 1977–1985



All fields of study



Natural sciences and engineering

SOURCE: National Center for Education Statistics, Degrees and Other Formal Awards Conferred survey, various years.

Indicator 2:10 Degrees earned, by race and ethnicity

- **Despite an increase in the young adult black population, blacks earned fewer degrees in 1985 than in 1977 at all degree levels except the first-professional.**
- **The number of degrees awarded to Hispanics, Asians, and American Indians/Alaskan Natives, however, was higher at all levels.**

The ability of our colleges and universities to attract and retain minority students is important to the Nation's success in achieving its goal of equal opportunity. Change in the number of degrees earned by minorities in relation to their population provides one measure of higher education's progress toward this goal.[1,2]

Blacks earned fewer degrees in 1985 than in 1977 at all degree levels except the first-professional (e.g., M.D., J.D.). The declines are particularly significant when compared with increases in the young adult black population during the same period: it rose 7 percent among 18- to 24-year-olds and 40 percent among 25- to 34-year-olds.[1] Men accounted for nearly two-thirds of the drop in degrees. Below is the percent change in degrees earned by blacks between 1977 and 1985.

Degree level	Black men	Black women
Bachelor's	−8	3
Master's	−33	−34
Doctor's	−27	22
First-professional	−8	81

Hispanics, Asians, and American Indians/Alaskan Natives earned more degrees in 1985 than in 1977 at all levels. The increase among Hispanics in the 1980s was in line with their population growth. Between 1982 and 1986, the Hispanic population 18 to 24 years old increased 13 percent and the population 18 to 34 years old increased 20 percent.[2] Over the same general period (1981 to 1985), the number of bachelor's degrees earned by Hispanics grew 19 percent and the number of all degrees to Hispanics grew 17 percent.

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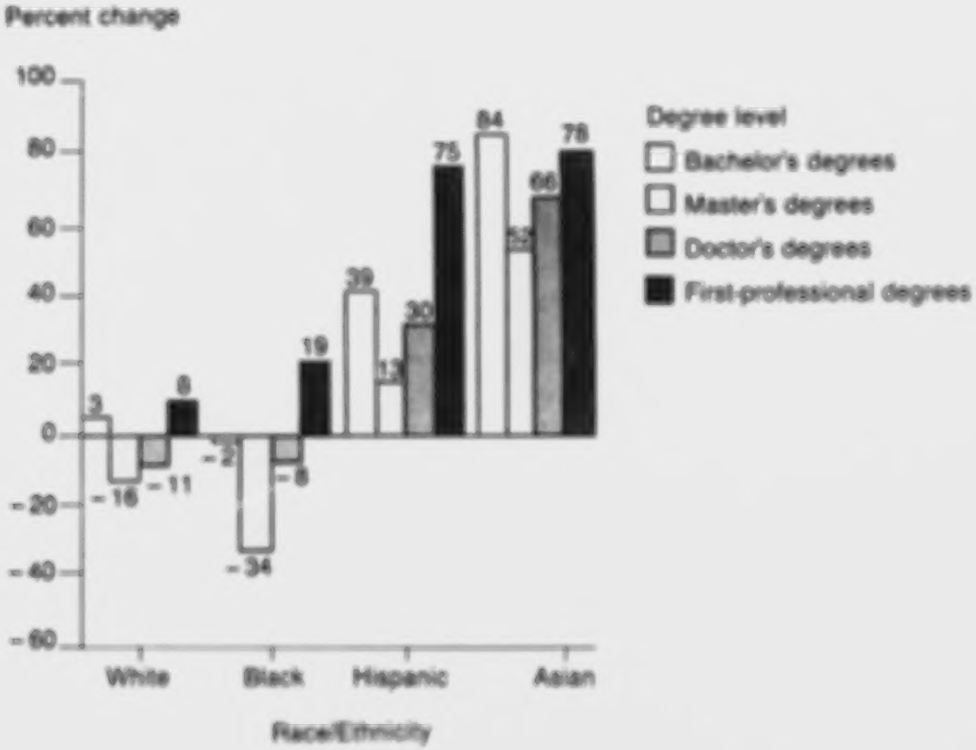
[1] U.S. Department of Commerce, Bureau of the Census, "Estimates of the Population of the United States, by Age, Sex, and Race," *Current Population Reports*. Series P-25, Nos. 917 and 1,000.

[2] U.S. Department of Commerce, Bureau of the Census, "The Hispanic Population in the United States: March 1986 and 1987 (Advance Report)," *Current Population Reports*. Series P-20, No. 416.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics*, 1980, 1982, 1987, and 1988 editions (based on the HEGIS survey of Earned Degrees Conferred, various years).

Chart 2:10.—Percent change in number of degrees earned, by degree level and race/ethnicity of recipient: Academic years ending 1977 and 1985



SOURCE: National Center for Education Statistics, Degrees and Other Formal Awards Conferred survey.

Indicator 2:11 Field of study, by race and ethnicity

- **In 1985, as in 1977, the natural sciences and engineering were far more popular among Asian degree recipients than among white and other minority recipients.**
- **Despite substantial declines in popularity between 1977 and 1985, education remains by far the most popular field at the master's level among non-Asian minorities.**

The field of study people pursue while in college is related to the jobs they get and the amounts they earn. A recent study by the Bureau of the Census, for example, showed that workers who had majored in engineering, natural sciences, or business and management generally had higher average earnings in 1984 than those who had majored in social science, education, or the humanities.[1] How racial and ethnic groups differ in their fields of study can provide clues to why they have different labor market experiences.

Racial/ethnic groups differ substantially in the fields they study. The most pronounced differences in 1985 as well as 1977 occurred in preferences for the natural sciences, engineering, and education.[2] The natural sciences and engineering were the most popular fields among Asian degree recipients. Much smaller proportions of the degree recipients from other racial/ethnic groups specialized in these fields.

Between 1977 and 1985, the number of degrees earned in these fields increased among all racial/ethnic groups, except among white and American Indian doctoral recipients. Minority gains were substantial in most cases.

During this period there was a substantial shift away from education at the bachelor's and master's levels among all racial/ethnic groups. Despite the large drop, education remains by far the most popular field among non-Asian minorities at the master's level. At the doctoral level, education degrees constitute the greatest portion of total degrees earned by blacks and American Indians.

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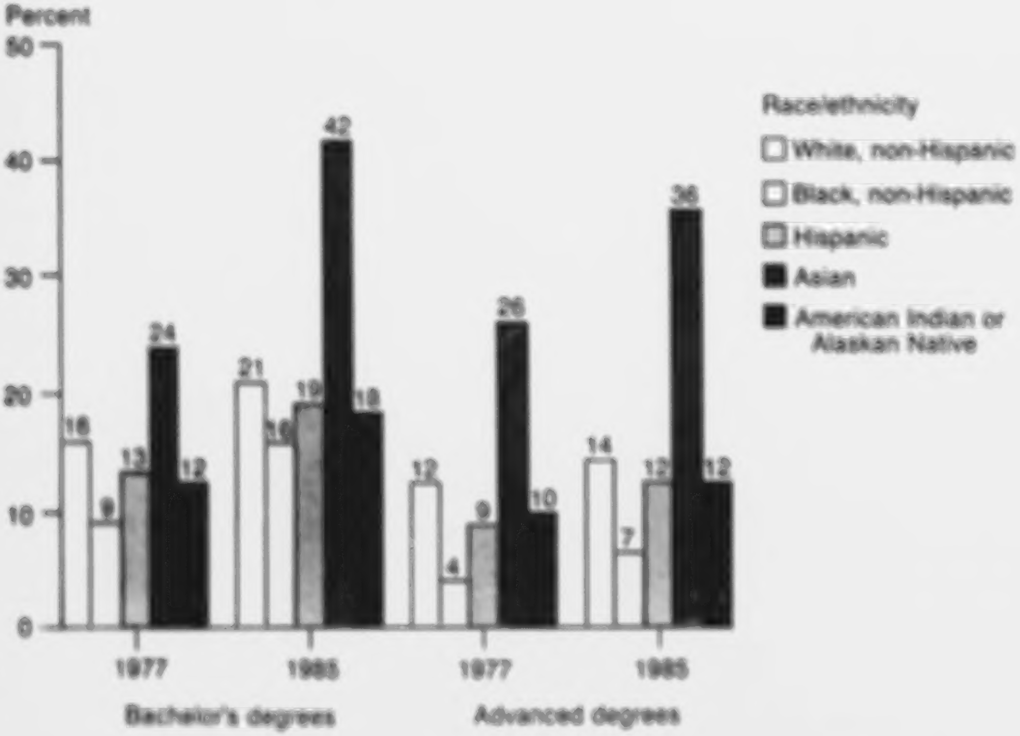
[1] U.S. Department of Commerce, Bureau of the Census, "What's It Worth? Educational Background and Economic Status: Spring 1984," *Current Population Reports*, Series P-70, No. 11. (Washington, D.C.: 1987), table 4.

[2] Natural science and engineering fields include physical and biological sciences, computer and information sciences, and engineering and engineering technologies.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics*, 1980 and 1988 editions (based on the HEGIS survey Earned Degrees Conferred).

Indicator 2:11

Chart 2:11.–Percent of degrees earned in natural sciences and engineering, by race/ethnicity and degree level: Academic years ending 1977 and 1985



SOURCE: National Center for Education Statistics, Degrees and Other Formal Awards Conferred survey

Indicator 2:12 Literacy among college students and graduates

- **Among young adults who had attended college 2 or more years but had not graduated, those still enrolled had higher functional literacy scores than those no longer enrolled.**
- **The literacy scores of young adults with 2 or more years of college completed who were still enrolled were similar to the scores of college graduates.**

Assessing what students learn in college has been the subject of rising interest in recent years. As yet, no consensus exists on what students should learn or how to assess that knowledge across different fields and different schools. In 1985, the National Assessment of Educational Progress assessed the literacy skills of 21- to 25-year-olds, including college students and graduates. While the basic literacy skills assessed in this survey would generally not be considered college-level, they could represent a foundation needed to pursue college-level studies.

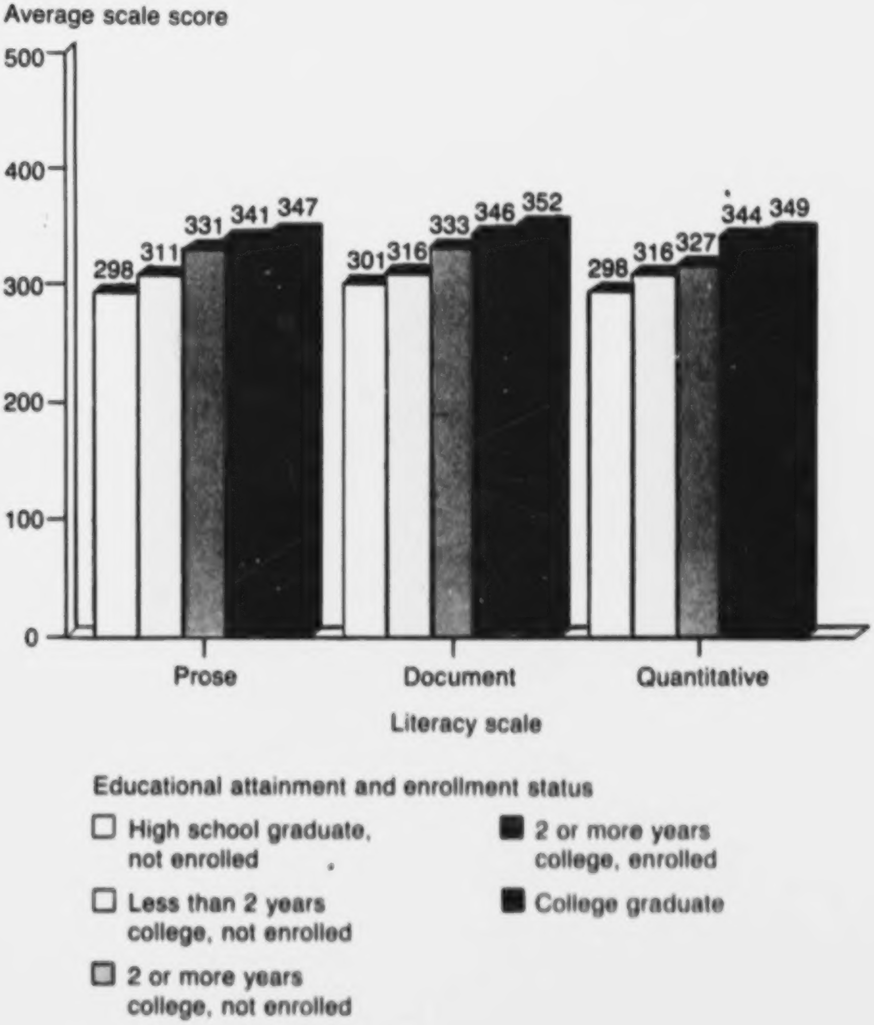
One possible conclusion based on these comparisons is that more literate students persist in college, but that the last 2 years of college do not contribute to an increase in literacy skills as measured by the prose, document, and quantitative scales. The literacy scales were defined as follows:

> *Prose comprehension*—the knowledge and skills needed to understand and use information from texts that include editorials, news stories, and poems.
>
> *Document literacy*—the knowledge and skills required to locate and use information contained in forms such as job applications, bus schedules, maps, and tables.
>
> *Quantitative literacy*—the knowledge and skills needed to apply arithmetic operations embedded in printed materials, such as a checkbook or order form.

Even college upperclassmen and graduates have ample room for improving their literacy skills. Half of the young adults with a 4-year college degree performed below the upper level of the literacy scales. This level included such tasks as summarizing in writing an argument made in a lengthy newspaper column and calculating the amount of a tip for a restaurant bill using a prescribed percentage.

SOURCE: U.S. Department of Education, National Center for Education Statistics, "Young Adult Literacy and Schooling," Monograph, forthcoming.

Chart 2:12–Average scores of white, non-Hispanic young adults aged 21 to 25, by educational attainment: 1985



SOURCE: National Center for Education Statistics, "Young Adult Literacy and Schooling," *Monograph*, forthcoming.

B. Resources:

B. Resources: Fiscal Resources

Indicator 2:13 Revenues of colleges and universities

- **State and local appropriations are the largest source of funds for public institutions (58 percent) but a negligible source (1 percent) for private institutions.**
- **Private institutions depend primarily on tuition and fees as a source of revenue (53 percent).**

This country contains a large number of colleges and universities—from community colleges, to liberal arts colleges, to professional schools, to research universities. About 1,500 of these institutions are governed by localities or by States primarily to serve their populations. Some 1,800 more are under private control, some religious and some independent. All institutions of higher education are supported by the same array of funding sources, but to widely varying degrees, depending upon whether they are publicly or privately controlled. These sources in turn are affected by a number of factors, including fluctuations in the economy and perceptions of whether investments, be they in the form of taxes, gifts or tuition payments, are yielding expected benefits—to individuals or to the country.

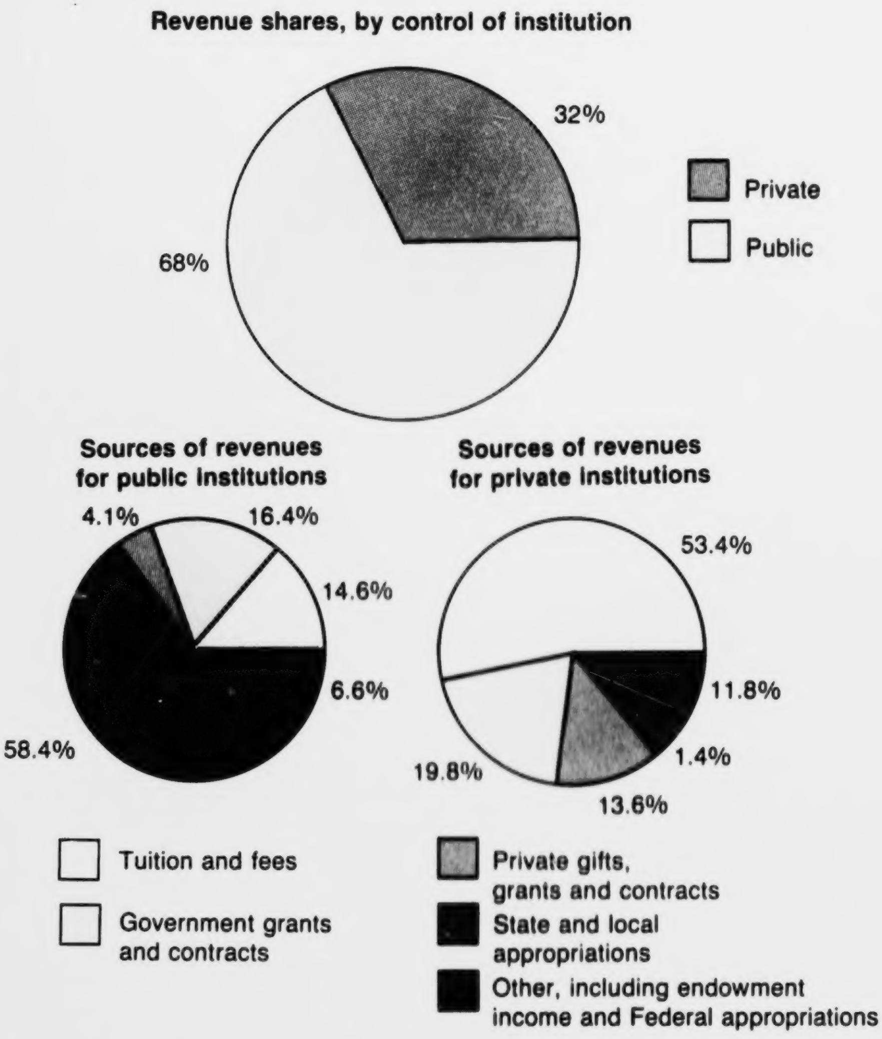
For public institutions, State and local appropriations were by far the most important revenue source throughout the period from 1976 to 1986. The second most important source in 1986 was government grants and contracts, most of which came from Federal sources. In the early years of the period, however, tuition and fees had been the second largest source of revenue for public institutions.

Private institutions relied heavily on tuition and fees and secondarily on government grants and contracts during the 1976–86 period. These institutions also derive a large share of their income from nongovernmental gifts, grants and contracts (14 percent) in 1986.

While private institutions acquired 32 percent of higher education revenues, they accounted for only 23 percent of higher education enrollment. Public 2-year institutions accounted for only 13 percent of all revenues but attracted 35 percent of the total enrollment. (See *Indicator 2:16* on enrollments.)

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1988* (based on the HEGIS surveys Financial Statistics of Institutions of Higher Education, various years, and Fall Enrollment in Colleges and Universities, various years).

Chart 2:13.—**Shares and sources of revenues for public and private institutions of higher education: Fiscal year 1986**



SOURCE: National Center for Education Statistics, *Digest of Education Statistics, 1988.*

Indicator 2:14 Allocation of expenditures per student and tuition levels

- **Expenditures for instruction, research, and administration, as well as undergraduate tuition charges, rose considerably more than inflation during the mid-1980s at both public and private universities.**
- **Since the early 1980s, tuition has increased proportionately more than instructional expenditures at all types of public and private colleges and universities.**

Rising college tuition is of considerable concern to policymakers, educators, and students and their families. Why tuition continues to climb is a hotly debated subject. Information on where colleges and universities spend their money and how expenditure patterns have changed in relation to tuition enhances the public debate.

With few exceptions, expenditures per full-time-equivalent (FTE) student, after inflation, were higher in academic year 1985–86 than in 1976–77 at all types of public and private, nonprofit institutions.* Much of the rise has occurred since the early 1980s. Administrative expenditures grew substantially, particularly at private universities, where they were 39 percent higher in 1986 than in 1977. Expenditures on instruction also grew between those years, but less than administrative expenditures. At universities and other 4-year institutions, especially public ones, expenditures on research, a major function of higher education, also were higher in 1986 than in 1977. Expenditures for scholarships and fellowships were up sharply at all types of private institutions. They increased comparatively little at public universities, however, and actually declined at other types of public institutions.

Following declines in the late 1970s, average undergraduate tuition and fees, adjusted for inflation, rose sharply at all types of public and private institutions during the first half of the 1980s. They grew proportionately more than comparable increases in instructional expenditures but, except at 2-year institutions, less than administrative expenditures. At all types of private institutions, expenditures for scholarships and fellowships grew proportionately more than tuition charges. This was not the case at public institutions, however.

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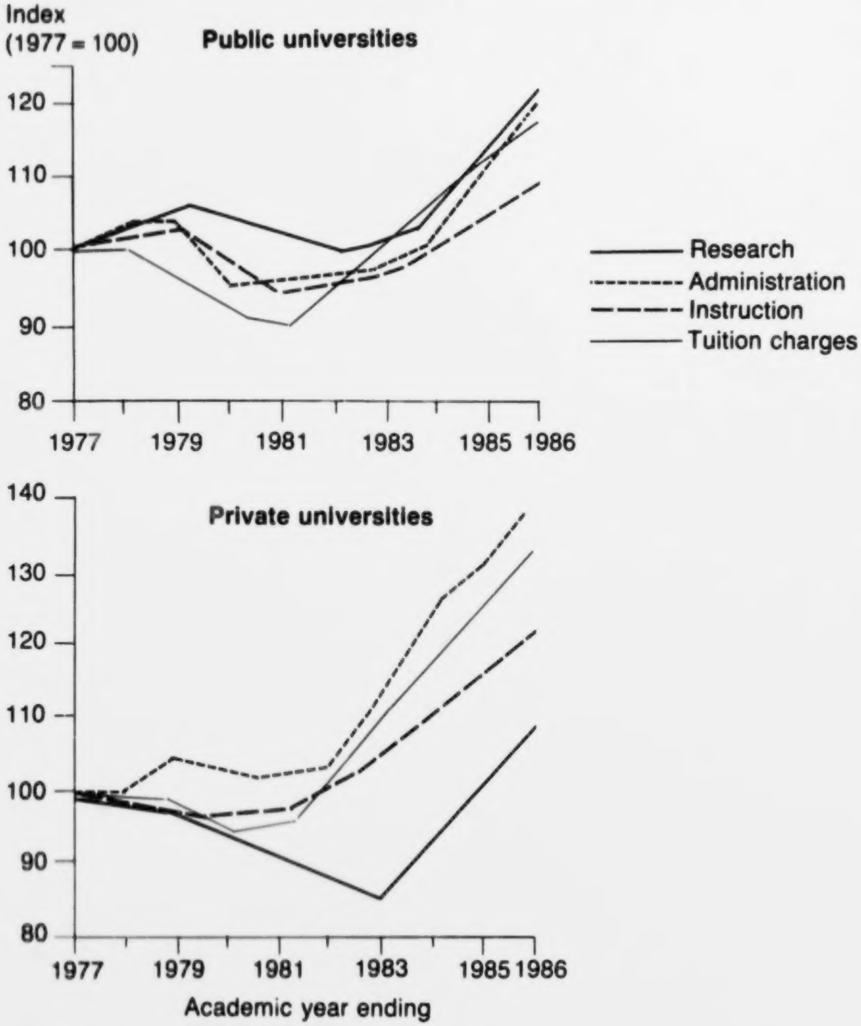
* This indicator presents expenditure data in indexed form where 1977 = 100. For actual dollars spent, see source document described below.

SOURCE: U.S. Department of Education, Center for Education Statistics, "Recent Trends in Higher Education Finance, 1976–77 to 1985–86," *Higher Education Administrative Costs: Continuing the Study* (based on the HEGIS surveys Financial Statistics of Institutions of Higher Education, Institutional Characteristics of Colleges and Universities, and Fall Enrollment in Colleges and Universities), 1988.

Chart 2:14.—Index of selected expenditures per full-time-equivalent student and average undergraduate tuition charges (in constant dollars) at public and private universities: Academic years ending 1977–1986



SOURCE: National Center for Education Statistics, surveys of Institutional Characteristics of Colleges and Universities, Fall Enrollment in Colleges and Universities, and Financial Statistics of Institutions of Higher Education, various years.

Indicator 2:15 Faculty salaries, by academic rank

- **During most of the 1970s and into the early 1980s, college faculty salaries at both public and private institutions steadily lost ground to inflation.**
- **Since the early 1980s, faculty salaries have consistently outpaced inflation, but recent salary increases have not been large enough to restore purchasing power to early 1970s levels.**

College faculty salaries are of interest for two reasons. First, they are a cost to colleges and universities and thus affect tuition levels, taxpayer charges, and student financial aid levels. Second, they can affect higher education's ability to attract and retain qualified instructional personnel.

The salaries of full, associate, and assistant professors[1] more than doubled between academic years ending 1972 and 1986. After adjusting for inflation, however, they declined substantially. Between the peak in 1973 and low point in 1981 or 1982, their purchasing power dropped by a little over 20 percent. After that, inflation-adjusted salaries climbed steadily upward. However, by 1986, the latest year for which data are available, the increases had not been big enough to compensate for earlier losses. The trends outlined here occurred at public as well as private institutions and at universities, other 4-year, and 2-year institutions.

To get a perspective on changes in college faculty salaries, it is useful to compare them with changes in the salaries of other professions. During the 14-year period from 1971–72 to 1985–86, particularly in the late 1970s and early 1980s, the salaries of faculty increased more slowly than those of persons in six other professional occupations employed in medium-sized and large private firms.[2] The average salary of a full professor, for example, increased 130 percent over the period, whereas the average salary of an attorney increased 174 percent.

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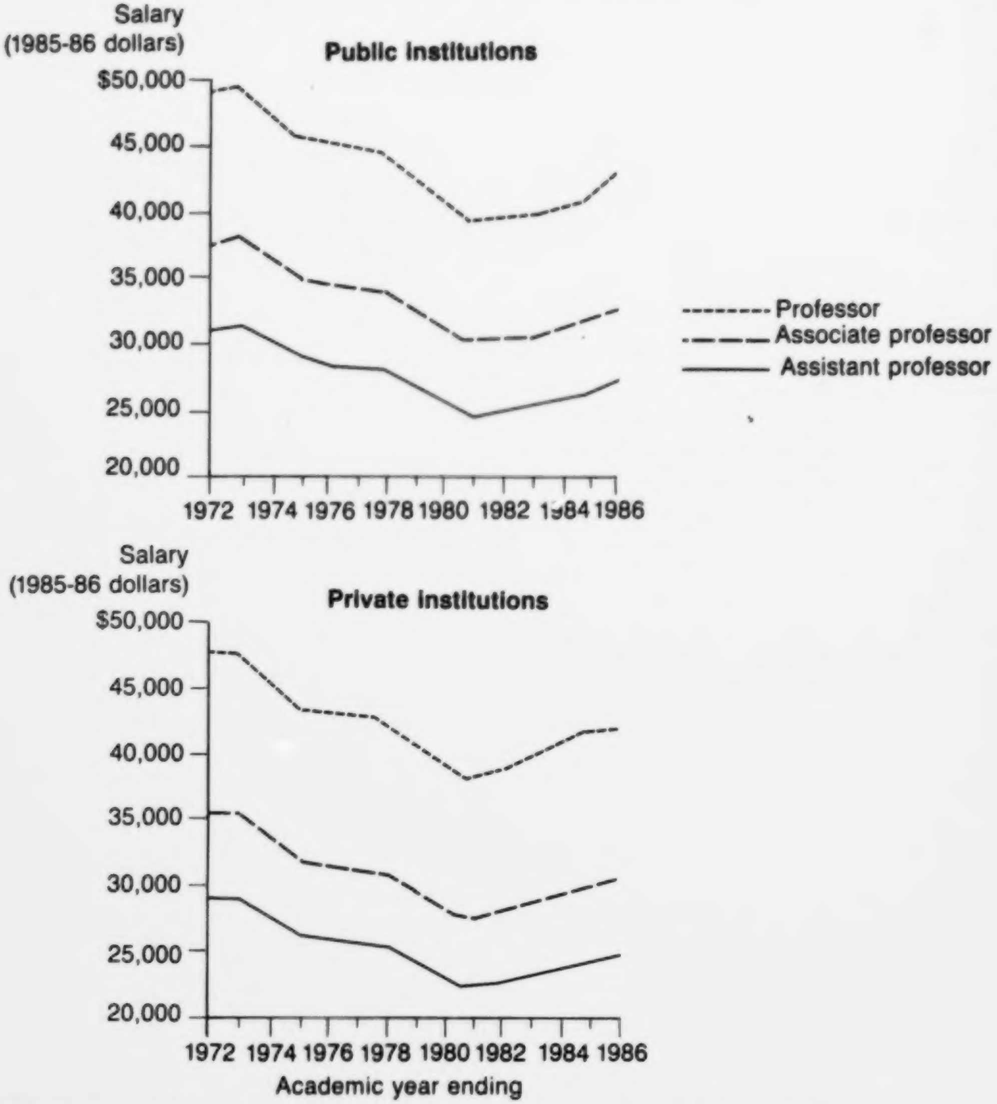
[1] This indicator displays salary changes between academic years 1971–72 and 1985–86 for three categories of full-time instructional staff on 9- or 10-month contracts—full professors, associate professors, and assistant professors.

[2] The occupations are: accountant, auditor, attorney, chief accountant, chemist, and engineer. Medium-sized and large firms are those employing 50 or more workers.

SOURCE: U.S. Department of Education, National Center for Education Statistics, the HEGIS survey Salaries, Tenure, and Fringe Benefits of Full-Time Instructional Faculty, various years. U.S. Department of Labor, Bureau of Labor Statistics, *National Survey of Professional, Administrative, Technical, and Clerical Pay, March 1982* (Bulletin 2145) and *March 1986* (Bulletin 2271).

Chart 2:15.—Trends in average faculty salaries, by academic rank and control of institution: Academic years ending 1972–1986



SOURCE: National Center Education Statistics, *Salaries, Tenure, and Fringe Benefits of Full-Time Instructional Faculty* survey, various years.

C. Context: Student Characteristics

Indicator 2:16 College and university enrollment, by type and control of institution

- **Total enrollment in colleges and universities increased by nearly 4 million (45 percent) between 1970 and 1983 and then increased by less than 1 percent from 1983 to 1987.**
- **Between 1970 and 1983, enrollment growth was greatest in 2-year institutions, more than doubling in size from 2.2 million to almost 4.7 million students.**

Colleges and universities are regularly grouped by the predominant length of programs they offer, 2-year or 4-year, and whether they operate under public or private control. Institutions in each category address somewhat different student needs. Enrollment trends in these institutions may indicate changing demand for different types of services offered.

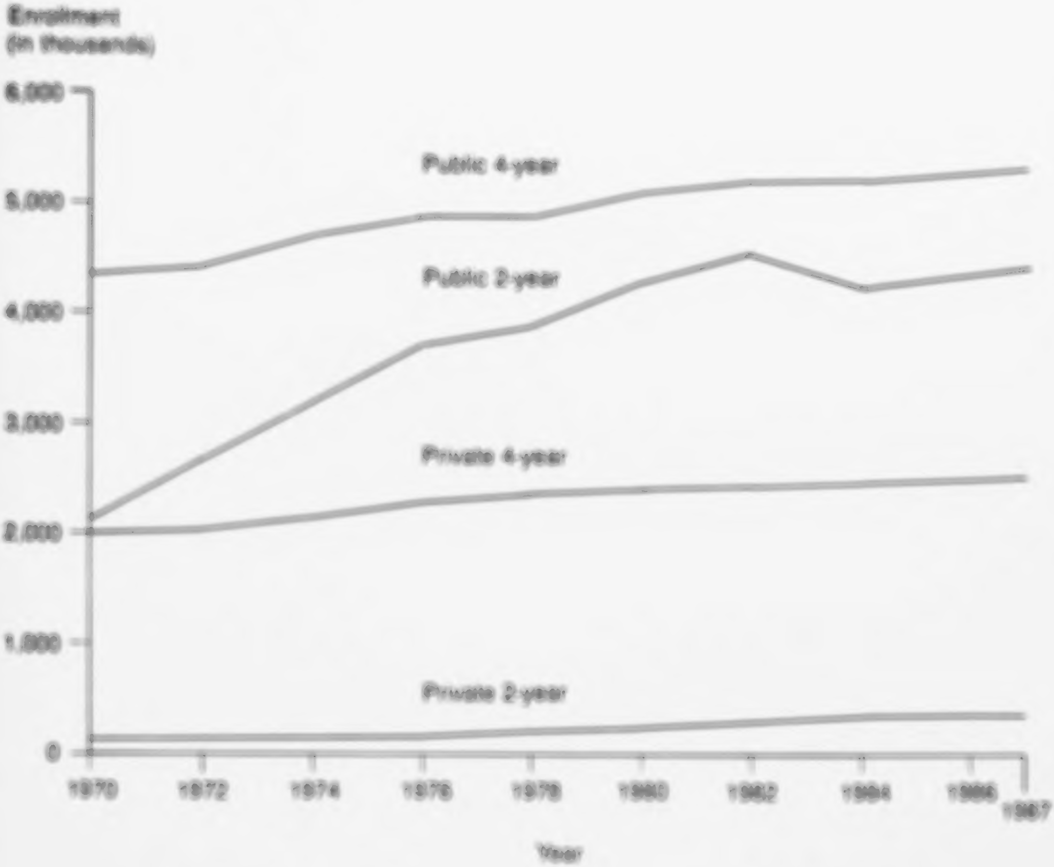
Between 1970 and 1983, enrollment in colleges and universities rose by 45 percent, from 8.6 million to 12.5 million. While the number of students at 4-year institutions grew by 22 percent, enrollment in 2-year institutions grew by 112 percent, reflecting, among other things, an increasing interest in higher education by the nontraditional older and part-time student. Public institutions, which enroll three times as many students as private institutions, increased their enrollments at a faster rate. Since 1983, enrollments at all types of institutions have been relatively steady, but in 1986 and 1987 enrollments were up slightly from 1985 levels. (See *Indicator 2:18*.)

Enrollments may also be measured in full-time equivalents (FTEs). For private schools, percent changes in FTE enrollments during the 1970s and early 1980s are not considerably different from the actual enrollments presented here. For public 2-year schools, however, the 1970-83 enrollment increase in FTEs was only 85 percent; the actual increase was 112 percent. The difference reflects the large number of students attending part-time.

In 1987, public institutions accounted for 77 percent of all higher education enrollment, and 2-year colleges accounted for 38 percent of all such enrollment. (See *Indicator 2:13* on revenues for a brief comparison of the distribution of enrollment with distribution of revenues, by type and control of institution.)

SOURCES: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1988* (based on the HEGIS survey Fall Enrollment in Institutions of Higher Education, various years); and "National Estimates of Higher Education Statistics: 1987," *Early Estimates*, December 1987.

Chart 2:16.—Trends in college and university enrollment, by type and control: Fall of selected years, 1970-1987



SOURCE: National Center for Education Statistics, *Digest of Education Statistics, 1988*

C. Context: Student Characteristics

Indicator 2:17 Selected characteristics of students in higher education

- **Between 1970 and 1987, the proportion of part-time students in institutions of higher education increased from 32 to an estimated 42 percent.**
- **The proportion of women enrolled also rose during that time from 41 to 53 percent.**
- **The proportion of students 25 years old or older rose from 28 percent in 1972 to 39 percent in 1986.**

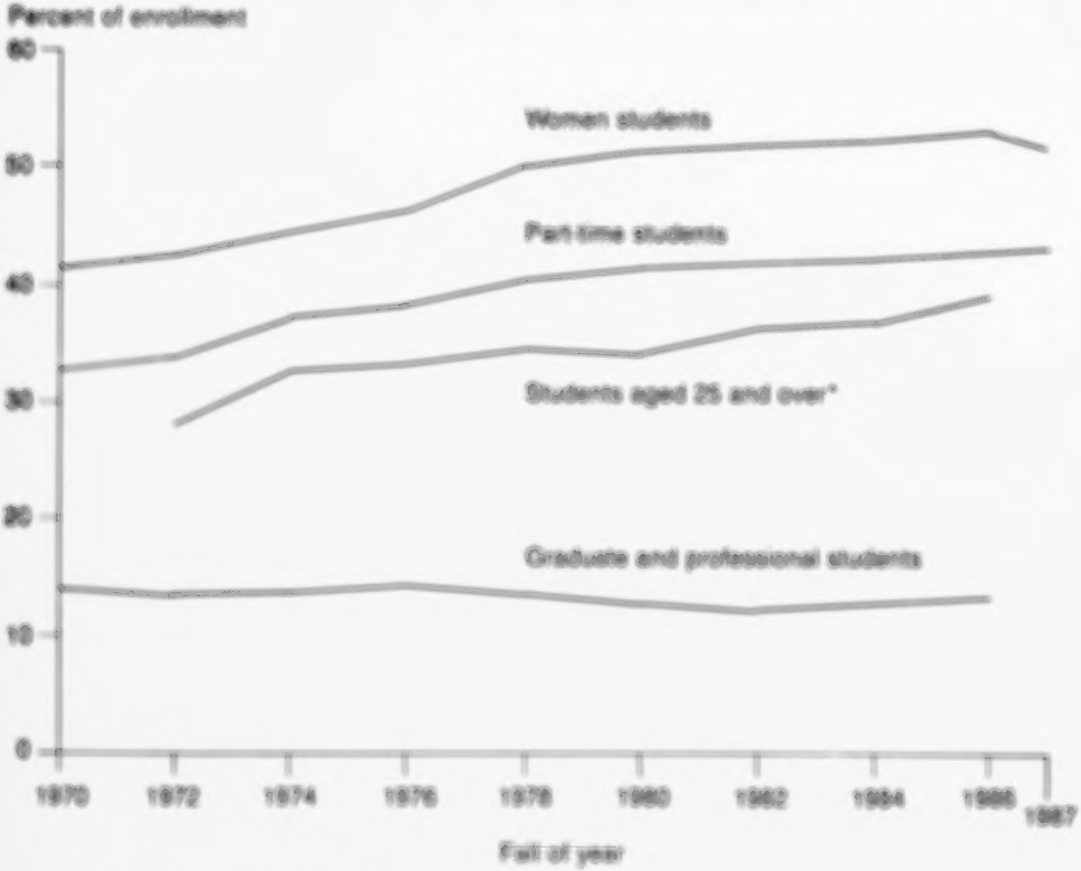
Changes in the composition of the enrollment in higher education signal changes in the larger society. For example, enrollment changes may reflect evolving needs of the labor force or a shift in the interest or ability of individuals to attend higher education.

In 1970, the typical college student was a male undergraduate between the ages of 18 and 24 attending full time. From 1970 to 1987, total enrollment in higher education increased substantially. But this increase was not uniform for all subcategories of students. While the number of typical students grew, gains were proportionally greater for part-time students, women students, and older students. However, in that time, the proportion of graduate and professional students changed little. As a result of these factors, the typical college student in 1987 was a female undergraduate, with an increasing likelihood that she was over 25 and attending part-time.

NOTE: Data for this indicator come from a HEGIS survey of all colleges and universities. Therefore, the enrollment figures differ somewhat from indicators where data from the Bureau of the Census survey of households are used.

SOURCES: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, (various years)* (based on the HEGIS survey Fall Enrollment in Colleges and Universities); "National Estimates of Higher Education Statistics: 1987," *Early Estimates*, December 1987. U.S. Department of Commerce, Bureau of the Census, "School Enrollments – Social and Economic Characteristics of Students, October (various years)," *Current Population Reports*, Series P-20; and unpublished tabulations.

Chart 2:17.—Trends in higher education enrollment for women, part-time students, students aged 25 or older, and graduate and professional students: Fall of selected years, 1970-1987



* Data for 1970 and 1987 not available.

SOURCES: National Center for Education Statistics, *Digest of Education Statistics, 1989*. Bureau of the Census, *Current Population Reports*, various years.

Indicator 2:18 College enrollment, by selected age groups

- **Between 1980 and 1986, college enrollment increased 9 percent, while the 18- to 24-year-old population decreased 8 percent.**
- **One factor leading to the enrollment increase was a rise in the enrollment rate of 18- to 24-year-olds.**

College education in the United States has shown enormous growth in the past 40 years. In part this growth reflects the twentieth century needs of business, industry, and government for a highly skilled and educated work force. Since 1950, enrollment has swelled by over 400 percent, while the number of institutions rose almost 60 percent. Throughout the past decade, however, many analysts and college administrators have expressed concern that the 1980s would be a period of declining enrollment in college education. Some analysts saw in the shrinking population of 18- to 24-year-olds evidence of coming decreases in enrollment.[2]

Contrary to these fears, while the 18- to 24-year-old population declined 7.8 percent between 1980 and 1986, their enrollment actually increased 2.4 percent. Thus a modest increase in their participation rate (from 24.7 percent to 27.4 percent) helped offset the projected decline. If this increase had not occurred, enrollment in 1986 would have been 734,000 below the actual figure of about 7,397,000.[3]

Another factor contributing to the rise in college enrollment in the 1980s was increased numbers of older students. These students enroll for enjoyment, to prepare for career changes, or to upgrade knowledge for current positions. In 1980, 2.9 percent of the population aged 25 years and over were enrolled in higher education. Between 1980 and 1986, the population in this age group increased by 12.3 percent. Had the same percentage of this age group continued to enroll in higher education, the number of students would have grown by approximately 475,000. However, a small rise in the participation rate of this population, from 2.9 to 3.2, brought the enrollment increase to about 878,000. Moreover, this population is growing, so if it maintains a stable participation rate, increasing numbers of students will come from this age group.

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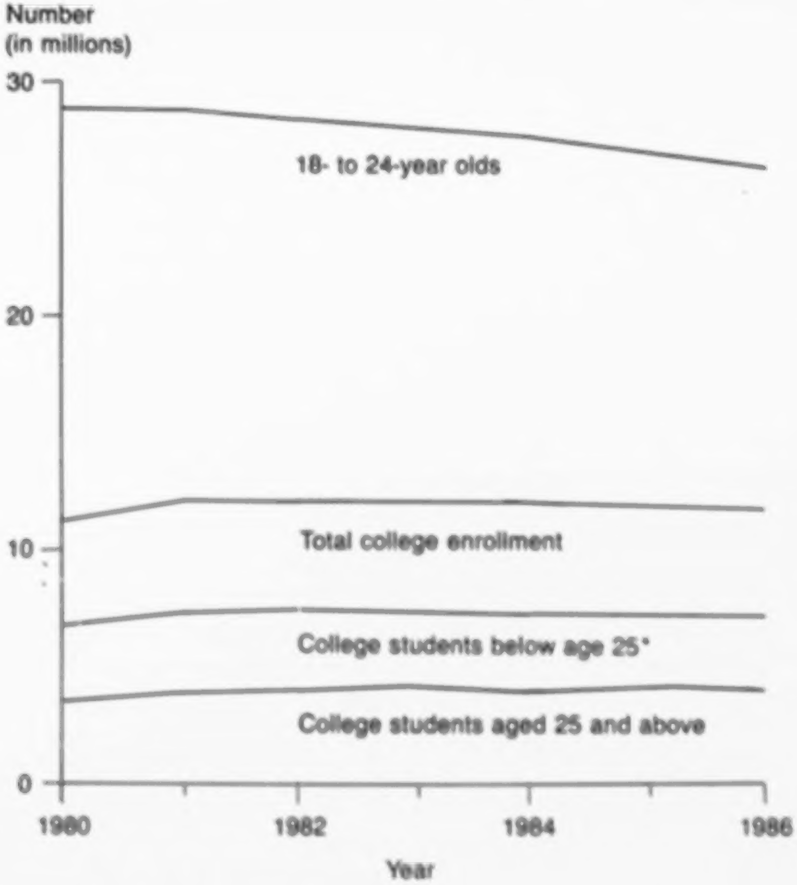
[2] F.E. Crossland, "Learning to Cope with a Downward Slope," *Change*, July–August 1980; and Carnegie Council on Policy Studies in Higher Education, *Three Thousand Futures*. (San Francisco: Jossey-Bass, 1980).

[3] Note that the data for this indicator come from a sample survey of households conducted by the Bureau of the Census. Therefore, the data differ somewhat from those used in indicators derived from the NCES HEGIS surveys of the universe of colleges and universities.

Chart 2:18.—Trends in college enrollment, by age and number of 18- to 24-year-olds: 1980-1986



* Below age 25 includes a few students 14 to 17.

SOURCE: Bureau of the Census, *Current Population Reports*, various years.

TEXT SOURCES: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1988*. U.S. Department of Commerce, Bureau of the Census, "School Enrollment—Social and Economic Characteristics of Students, [various years]," *Current Population Reports*, Series P-20; and unpublished tabulations.

Indicator 2:19 Enrollment patterns in higher education, by race and ethnicity

- **Among 18- to 24-year-olds, participation rates for blacks and Hispanics in higher education are below those of whites.**
- **Black and Hispanic participation rates in the mid-1980s were higher than they were in the early 1970s.**

Equal access for all qualified youth has long been a major goal of our education system. One measure of national progress toward that goal is the participation rates[1] of various populations in higher education. Changes in a participation rate may reflect many different factors, such as changes in the ability to afford higher education or in the quality of secondary schooling. Such changes may also alert higher education institutions to the need for altering policies or offerings.

The proportion of black and Hispanic 18- to 24-year-olds enrolled in higher education increased in the early 1970s but declined in the second half of the decade. By the mid-1980s, the rates for both groups were above those of the early 1970s.

Throughout the period, participation rates of blacks and Hispanics were lower than those of whites. Enrollment of whites between 1970 and 1980 ranged between 25 and 27 percent. In the last 3 years, it has equaled or exceeded 28 percent. Below are the participation rates of 18- to 24-year-olds in higher education.

Year	White	Black	Hispanic[2]
	Percent of 18–24-year-olds		
1972	26	18	13
1976	27	23	20
1980	26	19	16
1986	28	22	18

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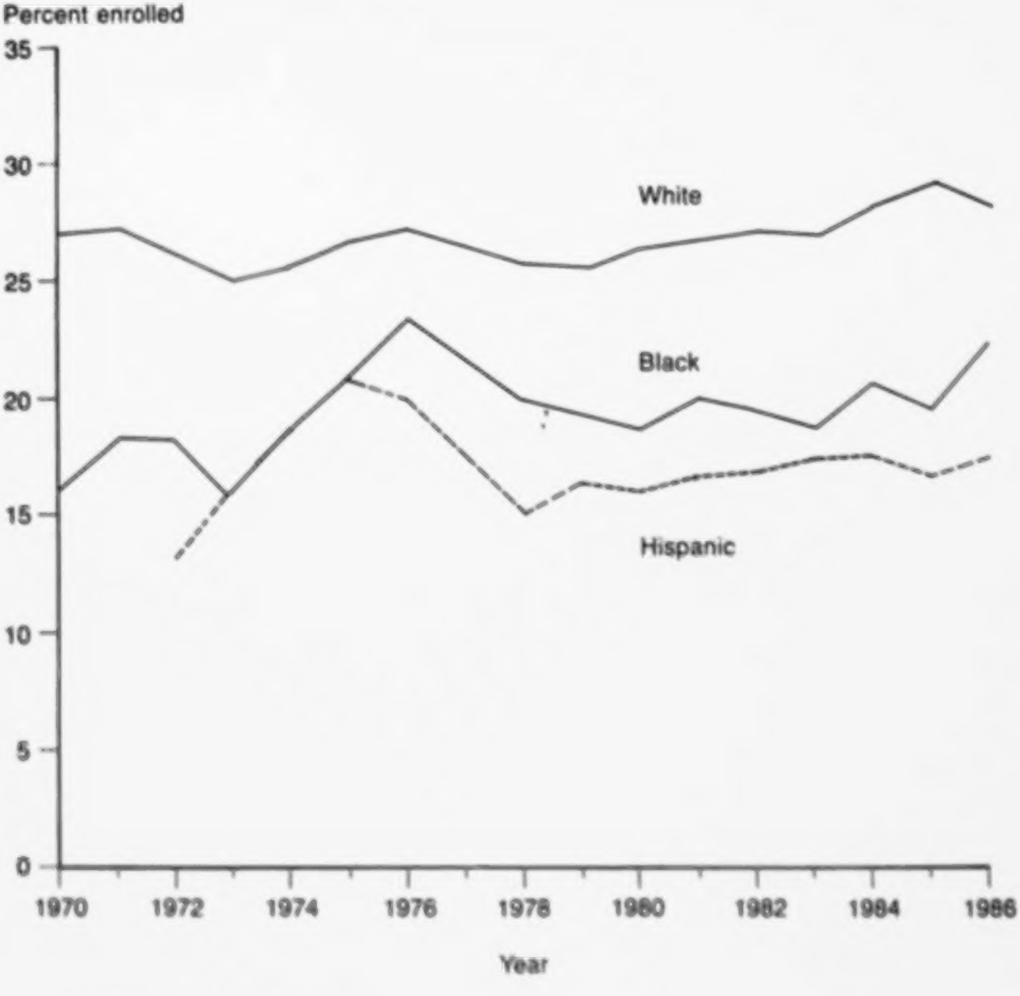
[1] Participation rates represent the proportion of a given subgroup enrolled in an institution of higher education. For example, the participation rate for 18- to 24-year-old blacks is calculated as 18- to 24-year-old black college students as a percent of all black 18- to 24-year-olds.

[2] Hispanics may be of any race.

SOURCE: U. S. Department of Commerce, Bureau of the Census, "School Enrollments – Social and Economic Characteristics of Students, October [various years]," *Current Population Reports*, Series P-20.

Chart 2:19.—Trends in college participation rates of 18- to 24-year-olds, by race and ethnicity: Fall, 1970–1986



NOTE: Hispanics may be of any race.

SOURCE: Bureau of the Census, *Current Population Reports*, various years.

A. Tables and Supplemental Notes

Table 1:1-1.—Average reading proficiency for students in grades 3, 7, and 11, by selected characteristics: 1986

Characteristic	Average reading proficiency*		
	Grade 3	Grade 7	Grade 11
Total	38.1	48.9	56.1
Race/ethnicity			
White	39.8	50.3	57.3
Black	33.4	45.2	51.5
Hispanic	33.2	44.4	51.3
Region			
Northeast	39.1	50.7	57.4
Southeast	37.2	48.1	54.8
Central	39.3	49.0	56.5
West	36.9	48.0	55.4
Type of community			
Disadvantaged urban	31.9	43.8	51.2
Advantaged urban	41.2	51.6	59.5
Sex			
Male	37.3	47.5	54.5
Female	38.9	50.3	57.7

*The range of the reading proficiency scale is 0 to 100.

SOURCE: National Assessment of Educational Progress, *Who Reads Best? Factors Related to Reading Achievement in Grades 3, 7, and 11*, 1988.

Table 1:1-2.—Percent of students at each level of written response to reading tasks, by grade: 1986

Task	Grade 3	Grade 7	Grade 11
		Percent	
Task one (story)			
Inadequate	70.0	36.7	20.8
Minimal	10.7	17.7	15.6
Satisfactory	18.5	38.1	41.3
Elaborated	.8	7.5	22.3
Task two (social studies)			
No comparison	69.6	36.2	25.6
Unsatisfactory comparison	29.9	60.4	62.9
Minimal comparison	.5	3.2	9.0
Satisfactory comparison	0	.2	1.6
Elaborated comparison	0	0	.9
Task three (story)			
Inadequate	—	16.6	5.8
Minimal	—	18.8	16.4
Satisfactory	—	50.4	58.1
Elaborated	—	14.3	19.7

— Not applicable.

SOURCE: National Assessment of Educational Progress, *Who Reads Best? Factors Related to Reading Achievement in Grades 3, 7, and 11,* 1988.

Table 1:1-3.—Standard errors for average reading proficiency for students in grades 3, 7, and 11, by selected characteristics: 1986 (table 1:1-1)

Characteristic	Average reading proficiency		
	Grade 3	Grade 7	Grade 11
Total	0.2	0.1	0.2
Race/ethnicity			
White	.2	.1	.2
Black	.4	.3	.3
Hispanic	.3	.4	.3
Region			
Northeast	.3	.3	.5
Southeast	.3	.2	.3
Central	.4	.2	.5
West	.4	.4	.4
Type of community			
Disadvantaged urban	.5	.4	.6
Advantaged urban	.5	.4	.5
Sex			
Male	.2	.2	.3
Female	.2	.1	.2

SOURCE: National Assessment of Educational Progress, *Who Reads Best? Factors Related to Reading Achievement in Grades 3, 7, and 11*, 1988.

Table 1:1-4.—Standard errors for percent of students at each level of written response to reading tasks, by grade: 1986 (table 1:1-2)

Task	Grade 3	Grade 7	Grade 11
		Percent	
Task one (story)			
Inadequate	1.2	1.4	1.0
Minimal	1.0	.9	.9
Satisfactory	1.0	1.1	1.5
Elaborated	.3	.8	1.8
Task two (social studies)			
No comparison	1.5	1.4	1.4
Unsatisfactory comparison	1.5	1.4	1.6
Minimal comparison	.2	.5	1.1
Satisfactory comparison	0	.2	.4
Elaborated comparison	0	0	.3
Task three (story)			
Inadequate	—	1.2	.7
Minimal	—	1.1	.9
Satisfactory	—	1.8	1.4
Elaborated	—	.7	1.2

—Not applicable.

SOURCE: National Assessment of Educational Progress, *Who Reads Best? Factors Related to Reading Achievement in Grades 3, 7, and 11,* 1988.

Supplemental note 1:1.–Average reading performance, by race/ethnicity

The 1985–86 National Assessment of Educational Progress (NAEP) reading assessment was administered to students at age 9/grade 3, age 13/grade 7, and age 17/grade 11. For this assessment, birth date ranges for eligible 9-, 13-, and 17-year-olds were defined as October 1 through September 30 for each age level, rather than the calendar year used previously for 9- and 13-year-olds. Thus, the modal grade levels for those age-eligible students were 3, 7, and 11 rather than 4, 8, and 11 reported for the 1983–84 assessment.

The 1985–86 assessment design was based on a variant of matrix sampling called Balanced Incomplete Block (BIB) spiralling. The entire assessment battery (including mathematics and science) was divided into blocks requiring approximately 15 minutes each, and each student was administered a booklet containing three blocks as well as a 6-minute block of background questions. Each assessment session lasted about one hour.

Six blocks of reading assessment questions were assessed at each age/grade level. As part of the partial BIB design, each pair of blocks within a subject area appeared in at least one booklet. In addition, some blocks were paired across subject areas. With three subject areas and a number of blocks within each subject area, the number of combinations of blocks (and therefore booklets) was large. Thus, at age 9/grade 3, 52 booklets were prepared. Twenty-nine of the booklets contained one or more reading blocks, with each of the six reading blocks appearing in six or seven booklets. Sixty-eight booklets were administered at age 13/grade 7, with 27 of them containing reading materials and each reading block appearing in six or seven different booklets. Reading items were included in 35 of the 96 booklets administered to students age 17/grade 11, with each reading block appearing seven times.

The spiralling feature of the BIB method cycles the booklets for administration so that typically only a few students in any assessment session receive the same booklet. At each age/grade level, each block of exercises was administered to approximately 2,600 students providing about 2,000 student responses to each item for the grade-level analyses reported in this indicator. Across all the booklets, the results contained in this report were based on 9,793 students at grade 3, 9,513 students at grade 7, and 16,510 students at grade 11.

Item response theory (IRT) methods were used to provide results for the NAEP reading scale. The main purpose of IRT analysis is to provide a common scale on which performance can be compared across groups and subgroups. It allows NAEP to estimate performance for any group or subgroup even though none of the respondents took all the exercises in the NAEP pool. For further information, see the *1983–84 NAEP Technical Report*.[9]

During the scaling process, it was noted that the results of the 1986 reading assessment were inconsistent with previous NAEP reading assessment results. In particular, of most concern was the fact that they indicated declines in average reading proficiency at ages 9 and 17. The declines did not appear to be limited to any section of the country, sex, race, or other reporting variable and the relative performance of the various subpopulation groups seemed reasonable. Therefore, the Educational Testing Service (ETS), in consultation with NAEP's Technical Advisory Panel, decided that the 1985–86 reading assessment was not equivalent to that administered in 1983–84. Thus, while it is appropriate to issue a cross-sectional report, it would not be appropriate to use the 1986 data to report trends over time in reading proficiency. To discourage comparisons of the 1986 data with previous NAEP reading data, the scale was changed from a 0 to 500 scale to a 0 to 100 scale with a mean of 50 and a standard deviation of 10. However, one component of the 1988 reading assessment is designed to provide the information necessary to adjust the 1986 results so they will be equivalent with the 1983–84 assessment and trends over time, incorporating the 1986 assessment, will be possible.

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[9] National Assessment of Education Progress, *Implementing the New Design: 1983–84 NAEP Technical Report*. (Princeton, N.J.: Educational Testing Service, 1986).

SOURCE: National Assessment of Educational Progress, *Who Reads Best? Factors Related to Reading Achievement in Grades 3, 7, and 11*.

Table 1:2-1.—Average mathematics proficiency scale scores for 9-, 13-, and 17-year-old students: Selected years, 1973-1986

Age	1973[1]	1978	1982	1986
9	221.5	222.5	222.8	225.4
13	258.8	258.0	262.3	262.6
17	308.7	300.4	294.2	288.2

[1] The 1973 mathematics assessment was not included in the scaling of NAEP trend data. However, a rough estimate of the 1973 mean level of student math proficiency was computed by NAEP.

SOURCE: National Assessment of Educational Progress, *The Mathematics Report Card: Are We Measuring Up?*, 1988.

Table 1:2-2.—Percent of 9-, 13-, and 17-year-old students at or above the five proficiency levels on the mathematics proficiency scale: 1978, 1982, and 1986

Proficiency levels	Age	1978	1982	1986
		Percent		
150	9	97.0	98.2	98.0
Simple arithmetic facts	13	99.8	99.9	100.0
	17	100.0	100.0	100.0
200	9	74.3	75.6	78.1
Beginning skills and understanding	13	93.6	97.1	98.1
	17	98.5	99.1	99.8
250	9	21.9	21.1	23.6
Basic operations and problem solving	13	58.6	65.9	68.7
	17	91.3	91.5	97.2
300	9	.8	.6	.8
Moderately complex procedures and reasoning	13	12.9	11.5	10.4
	17	38.3	34.4	35.5
350	9	0	0	0
Multistep problem solving and algebra	13	.3	.2	.1
	17	4.0	3.4	4.3

SOURCE: National Assessment of Educational Progress, *The Mathematics Report Card: Are We Measuring Up?*, 1988.

Table 1:2-3.—*Average mathematics proficiency scale scores for 9-, 13-, and 17-year-olds, by selected characteristics: 1978, 1982, and 1986*

Selected characteristic	1978	1982	1986
Age 9	222.5	222.8	225.4
Sex			
Male	221.2	221.0	225.4
Female	223.7	224.5	225.4
Ethnicity/race			
White	227.7	227.6	230.4
Black	197.3	199.8	206.1
Hispanic	207.4	208.4	209.8
Other	230.7	241.5	225.5
Grade			
< Modal grade	195.9	198.0	202.8
= Modal grade	232.0	233.4	237.0
> Modal grade	243.5	260.5	251.4
Region			
Northeast	230.4	229.2	229.5
Southeast	213.1	214.6	221.7
Central	227.6	224.8	229.5
West	217.5	223.1	221.1
Size/type of community			
Extreme rural	216.4	215.1	222.7
Low metropolitan	203.4	203.5	208.7
High metropolitan	240.4	241.9	241.5
Parental education			
Less than high school	204.9	203.6	205.2
Graduate high school	223.0	222.2	222.2
Some education after high school	233.4	226.7	232.0
Graduate college	234.6	232.2	234.6
Unknown	215.5	216.7	218.3

Table 1:2-3.—Average mathematics proficiency scale scores for 9-, 13-, and 17-year-olds, by selected characteristics: 1978, 1982, and 1986—Continued

Selected characteristic	1978	1982	1986
Age 9 (cont.)			
Within-year quartiles			
Upper	258.2	258.2	261.4
Middle two	224.2	224.4	227.0
Lower	183.1	184.0	188.3
Across-year quartiles			
Upper	258.5	258.6	260.1
Middle two	224.8	224.7	225.1
Lower	183.8	183.9	184.6
Type of school			
Public	221.1	220.9	223.9
Private	233.8	236.1	233.4
Number of reading items in home			
0–2	205.6	207.6	212.1
3	224.8	224.2	227.1
4	234.7	233.9	237.2
Television watched/day			
0–2 hours	—	222.1	225.3
3–5 hours	—	230.9	232.1
6 hours or more	—	218.6	216.9
Missing	—	179.1	204.9
Languages other than English			
Often	—	217.8	206.6
Sometimes	—	223.6	225.7
Never	—	224.2	227.1

Table 1:2-3.—Average mathematics proficiency scale scores for 9-, 13-, and 17-year-olds, by selected characteristics: 1978, 1982, and 1986—Continued

Selected characteristic	1978	1982	1986
Age 13	258.0	262.3	262.2
Sex			
Male	257.5	262.9	263.6
Female	258.5	261.7	261.7
Ethnicity/race			
White	265.1	267.8	267.0
Black	225.3	235.6	243.9
Hispanic	232.2	247.0	248.7
Other	266.0	267.9	275.6
Grade			
< Modal grade	234.8	242.0	245.7
= Modal grade	267.2	269.8	270.8
> Modal grade	289.8	295.7	289.1
Region			
Northeast	266.1	270.1	269.8
Southeast	247.2	252.3	257.4
Central	263.0	266.2	258.9
West	254.2	258.8	264.0
Size/type of community			
Extreme rural	248.9	252.5	263.7
Low metropolitan	228.8	241.0	242.6
High metropolitan	277.6	283.7	278.3
Parental education			
Less than high school	239.6	245.6	248.9
Graduate high school	257.1	258.9	256.7
Some education after high school	266.6	268.4	267.1
Graduate college	276.7	275.3	273.0
Unknown	234.7	246.4	242.2
Within-year quartiles			
Upper	296.6	297.2	297.4
Middle two	259.3	262.9	262.3
Lower	218.8	226.0	228.4
Across-year quartiles			
Upper	296.9	296.8	297.4
Middle two	261.0	261.3	260.4
Lower	219.3	223.6	224.8

Table 1:2-3.—Average mathematics proficiency scale scores for 9-, 13-, and 17-year-olds, by selected characteristics: 1978, 1982, and 1986—Continued

Selected characteristic	1978	1982	1986
Age 13 (cont.)			
Type of school			
Public	256.6	260.9	262.4
Private	272.3	274.1	269.0
Number of reading items in home			
0–2	234.6	244.8	249.3
3	254.3	260.3	259.4
4	268.4	272.5	270.7
Television watched/day			
0–2 hours	–	266.5	269.3
3–5 hours	–	262.7	264.4
6 hours or more	–	250.1	249.6
Missing	–	260.0	258.8
Languages other than English			
Often	–	253.0	249.9
Sometimes	–	264.6	269.1
Never	–	262.5	261.8
Time spent on homework			
None was assigned	–	256.3	251.1
Did not do it	–	262.5	255.7
Less than 1 hour	–	265.2	259.8
1 to 2 hours	–	266.1	264.8
More than 2 hours	–	263.2	262.3
Missing	–	256.1	232.9
Describe your grades			
Mostly A	–	283.0	288.4
Half A's/half B's	–	271.9	274.4
Mostly B	–	267.8	269.8
Half B's/half C's	–	254.1	255.0
Mostly C	–	248.5	253.0
Half C's/half D's	–	238.3	245.0
Mostly D	–	233.8	237.9
Mostly below D	–	227.0	233.9
Missing	–	256.6	232.3

Table 1:2-3.—Average mathematics proficiency scale scores for 9-, 13-, and 17-year-olds, by selected characteristics: 1978, 1982, and 1986—Continued

Selected characteristic	1978	1982	1986
Age 17	286.4	284.2	288.2
Sex			
Male	290.3	287.6	291.3
Female	282.7	281.0	285.3
Ethnicity/race			
White	292.7	290.1	294.5
Black	249.9	253.9	261.6
Hispanic	259.0	259.4	266.7
Other	300.7	296.7	291.3
Grade			
<Modal grade	254.9	256.5	260.1
=Modal grade	291.3	288.9	293.6
>Modal grade	296.6	293.4	296.3
Region			
Northeast	293.6	290.6	294.4
Southeast	277.2	277.3	282.9
Central	291.8	288.3	290.0
West	280.8	279.3	285.2
Size/type of community			
Extreme rural	280.5	278.3	291.3
Low metropolitan	254.6	260.5	254.8
High metropolitan	309.3	306.6	305.0
Parental education			
Less than high school	262.7	262.3	262.4
Graduate high school	279.0	278.4	278.1
Some education after high school	292.0	290.4	291.9
Graduate college	305.1	300.1	301.8
Unknown	258.3	253.7	263.8
Within-year quartiles			
Upper	329.7	327.1	331.3
Middle two	287.8	284.5	287.6
Lower	240.0	240.7	246.3
Across-year quartiles			
Upper	328.8	328.8	331.2
Middle two	287.0	286.2	285.7
Lower	239.8	241.5	243.4

Table 1:2-3.—Average mathematics proficiency scale scores for 9-, 13-, and 17-year-olds, by selected characteristics: 1978, 1982, and 1986—Continued

Selected characteristic	1978	1982	1986
Age 17 (cont.)			
Type of school			
Public	285.5	282.9	287.3
Private	302.2	298.9	308.9
Number of reading items in home			
0–2	260.1	264.2	264.5
3	281.6	280.1	282.1
4	295.4	292.4	295.6
Television watched/day			
0–2 hours	291.9	289.2	297.4
3–5 hours	281.1	279.0	284.3
6 hours or more	261.9	263.1	265.8
Missing	278.3	263.1	217.0
Languages other than English			
Often	272.5	274.5	274.4
Sometimes	285.9	284.2	291.7
Never	289.3	285.6	288.6
Time spent on homework			
None was assigned	273.2	269.6	266.8
Did not do it	287.7	289.0	289.3
Less than 1 hour	292.6	289.0	289.6
1 to 2 hours	296.1	290.7	287.9
More than 2 hours	303.4	296.6	300.8
Missing	277.8	269.9	226.7
Describe your grades			
Mostly A	—	315.8	325.8
Half A's/half B's	—	298.4	305.3
Mostly B	—	293.5	296.8
Half B's/half C's	—	276.9	281.0
Mostly C	—	270.5	276.5
Half C's/half D's	—	256.8	263.2
Mostly D	—	253.0	257.6
Mostly below D	—	247.6	265.7
Missing	—	271.1	255.4

Table 1:2-3.—Average mathematics proficiency scale scores for 9-, 13, and 17-year-olds, by selected characteristics: 1978, 1982, and 1986—Continued

Selected characteristic	1978	1982	1986
Age 17 (cont.)			
High school program			
General	—	269.6	271.7
Academic/college prep	—	304.8	305.3
Vocational/technical	—	266.9	269.3
Taken computer programming?			
Have	305.9	296.9	299.6
Have not	284.8	282.2	286.8
Highest level math taken			
Pre-algebra (or less)	248.0	250.1	254.2
Algebra (1st year)	270.5	271.1	270.6
Geometry	293.8	287.4	287.2
Algebra (2nd year)	310.4	306.5	308.5
Calculus	324.4	318.6	335.3
Something else	256.4	258.9	259.2

—Not available.

SOURCE: National Assessment of Educational Progress, *The Mathematics Report Card: Are We Measuring Up?*, 1988.

Table 1:2-4.—Standard errors for average mathematics proficiency scale scores for 9-, 13-, and 17-year-old students: 1978, 1982, and 1986 (table 1:2-1)

Age	1978	1982	1986
9	0.8	1.1	1.0
13	1.1	1.1	1.1
17	1.1	1.1	1.0

SOURCE: National Assessment of Educational Progress, *The Mathematics Report Card: Are We Measuring Up?*, 1988.

Table 1:2-5.—Standard errors for percent of 9-, 13-, and 17-year-old students at or above the five proficiency levels on the mathematics proficiency scale: 1978, 1982, and 1986 (table 1:2-2)

Proficiency levels	Age	1978	1982	1986
		Standard errors		
150	9	0.2	0.2	0.2
Simple arithmetic facts	13	.0	.0	.0
	17	.0	.0	.0
200	9	.8	1.1	1.1
Beginning skills and	13	.4	.4	.2
understanding	17	.2	.1	.1
250	9	.6	.9	.9
Basic operations and	13	1.2	1.2	1.8
problem solving	17	.9	.9	.6
300	9	.1	.1	.2
Moderately complex	13	.6	.7	.9
procedures and reasoning	17	1.0	1.1	1.2
350	9	.0	.0	.0
Multi-step problem	13	.1	.0	.0
solving and algebra	17	.3	.3	.4

SOURCE: National Assessment of Educational Progress, *The Mathematics Report Card: Are We Measuring Up?*, 1988.

Table 1:2-6.—Standard errors for average mathematics proficiency scale scores for 9-, 13-, and 17-year-olds, by selected characteristics: 1978, 1982, and 1986 (table 1:2-3)

Selected characteristic	1978	1982	1986
Age 9	0.8	1.1	1.0
Sex			
Male	0.7	1.2	1.0
Female	1.0	1.1	1.1
Ethnicity/race			
White	0.9	1.0	1.0
Black	1.1	1.6	1.6
Hispanic	2.2	1.3	2.0
Other	3.1	4.1	7.2
Grade			
<Modal grade	1.0	1.3	1.0
=Modal grade	0.8	1.0	1.0
>Modal grade	5.5	10.6	10.3
Region			
Northeast	1.8	1.7	2.6
Southeast	1.1	2.7	2.4
Central	1.4	2.3	2.2
West	1.3	1.6	2.3
Size/type of community			
Extreme rural	2.6	1.7	6.7
Low metropolitan	2.6	2.4	1.8
High metropolitan	2.0	2.4	2.6
Parental education			
Less than high school	1.4	1.6	2.4
Graduate high school	1.1	1.1	1.6
Some education after high school	1.6	2.0	2.0
Graduate college	1.1	1.4	1.1
Unknown	1.0	1.5	1.3

Table 1:2-6.—Standard errors for average mathematics proficiency scale scores for 9-, 13-, and 17-year-olds, by selected characteristics: 1978, 1982, and 1986—Continued (table 1:2-3)

Selected characteristic	1978	1982	1986
Age 9 (cont.)			
Within-year quartiles			
Upper	0.8	0.6	0.7
Middle two	0.5	0.5	0.5
Lower	0.6	0.7	0.7
Across-year quartiles			
Upper	0.7	0.6	0.7
Middle two	0.5	0.5	0.4
Lower	0.6	0.7	0.8
Type of school			
Public	0.8	1.0	1.2
Private	1.7	2.2	2.4
Number of reading items in home			
0–2	0.8	1.1	1.1
3	0.7	1.1	1.0
4	0.8	1.2	1.1
Television watched/day			
0–2 hours	—	1.3	1.5
3–5 hours	—	1.0	1.1
6 hours or more	—	1.1	1.3
Missing	—	2.7	12.1
Languages other than English			
Often	—	1.6	1.9
Sometimes	—	1.4	1.5
Never	—	0.9	1.0

Table 1:2-6.—Standard errors for average mathematics proficiency scale scores for 9-, 13-, and 17-year-olds, by selected characteristics: 1978, 1982, and 1986—Continued (table 1:2-3)

Selected characteristic	1978	1982	1986
Age 13	1.1	1.1	1.1
Sex			
Male	1.2	1.3	1.1
Female	1.0	1.0	1.4
Ethnicity/race			
White	0.8	0.8	1.2
Black	1.8	1.3	2.1
Hispanic	2.1	1.3	2.8
Other	3.4	0.8	3.2
Grade			
<Modal grade	1.4	1.3	1.1
=Modal grade	1.0	0.8	0.8
>Modal grade	7.3	7.2	7.8
Region			
Northeast	2.3	2.1	2.1
Southeast	3.0	2.2	1.4
Central	1.7	1.8	4.3
West	1.8	2.2	2.0
Size/type of community			
Extreme rural	3.0	1.8	6.2
Low metropolitan	3.7	4.4	2.8
High metropolitan	1.6	1.6	0.8
Parental education			
Less than high school	1.1	1.3	2.1
Graduate high school	1.0	0.8	1.2
Some education after high school	1.1	0.8	0.8
Graduate college	1.2	1.4	1.3
Unknown	1.3	2.7	2.2
Within-year quartiles			
Upper	0.8	0.7	0.7
Middle two	0.5	0.5	0.6
Lower	0.7	0.7	0.8
Across-year quartiles			
Upper	0.8	0.7	0.7
Middle two	0.5	0.5	0.6
Lower	0.7	0.7	0.7

Indicator 1:2

Table 1:2-6.—Standard errors for average mathematics proficiency scale scores for 9-, 13-, and 17-year-olds, by selected characteristics: 1978, 1982, and 1986—Continued (table 1:2-3)

Selected characteristic	1978	1982	1986
Age 13 (cont.)			
Type of school			
Public	1.1	1.2	1.2
Private	1.3	1.8	4.8
Number of reading items in home			
0-2	1.2	1.1	2.3
3	1.1	1.2	1.2
4	0.9	0.9	1.1
Television watched/day			
0-2 hours	—	1.1	1.7
3-5 hours	—	1.1	1.1
6 hours or more	—	1.7	1.1
Missing	—	3.2	10.3
Language other than English			
Often	—	1.8	2.7
Sometimes	—	1.2	1.4
Never	—	1.1	1.1
Time spent on homework			
None was assigned	—	1.3	2.5
Did not do it	—	2.2	3.8
Less than 1 hour	—	1.2	1.5
1 to 2 hours	—	1.2	1.1
More than 2 hours	—	2.3	2.4
Missing	—	3.5	10.4
Describe your grades			
Mostly A	—	1.2	1.8
Half A/half B's	—	1.4	1.5
Mostly B	—	0.9	1.5
Half B/half C's	—	0.9	1.3
Mostly C	—	1.2	1.5
Half C/half D's	—	1.4	1.8
Mostly D	—	3.8	
Mostly below D	—	4.1	3.5
Missing	—	3.3	1.9

Table 1:2-6.—Standard errors for average mathematics proficiency scale scores for 9-, 13-, and 17-year-olds, by selected characteristics: 1978, 1982, and 1986—Continued (table 1:2-3)

Selected characteristic	1978	1982	1986
Age 17	1.1	1.1	1.0
Sex			
Male	1.1	1.2	1.3
Female	1.2	1.2	1.1
Ethnicity/race			
White	1.0	1.0	1.1
Black	1.3	1.5	2.4
Hispanic	2.5	2.3	3.3
Other	3.8	10.0	8.2
Grade			
< Modal grade	1.3	1.7	1.8
= Modal grade	1.1	1.0	1.0
> Modal grade	1.1	1.6	3.4
Region			
Northeast	2.0	2.4	2.2
Southeast	2.0	2.4	1.8
Central	2.1	1.3	2.1
West	2.0	2.2	3.1
Size/type of community			
Extreme rural	1.7	2.6	3.8
Low metropolitan	2.0	2.8	2.3
High metropolitan	2.2	3.1	3.8
Parental education			
Less than high school	1.3	1.2	2.6
Graduate high school	1.0	0.8	1.2
Some education after high school	1.0	1.0	1.4
Graduate college	1.2	1.2	1.6
Unknown	2.2	2.1	2.8

Table 1:2-6.—Standard errors for average mathematics proficiency scale scores for 9-, 13-, and 17-year-olds, by selected characteristics: 1978, 1982, and 1986—Continued (table 1:2-3)

Selected characteristic	1978	1982	1986
Age 17 (cont.)			
Within-year quartiles			
Upper	0.5	0.7	0.8
Middle two	0.4	0.4	0.5
Lower	0.6	0.7	1.0
Across-year quartiles			
Upper	0.4	0.7	0.5
Middle two	0.4	0.4	0.5
Lower	0.6	0.7	1.1
Type of school			
Public	1.1	1.1	1.1
Private	3.3	2.0	11.2
Number of reading items in home			
0-2	1.5	1.3	1.8
3	1.3	1.1	1.5
4	1.0	0.9	1.1
Television watched/day			
0-2 hours	1.2	1.1	1.4
3-5 hours	1.3	1.1	1.2
6 hours or more	2.3	1.6	2.7
Missing	1.7	4.4	12.1
Languages other than English			
Often	2.4	3.1	2.6
Sometimes	1.4	1.2	1.6
Never	1.1	1.1	1.2
Time spent on homework			
None was assigned	1.1	1.1	2.4
Did not do it	1.3	1.4	3.2
Less than 1 hour	1.1	1.2	1.3
1 to 2 hours	1.2	1.2	1.2
More than 2 hours	1.7	1.6	3.2
Missing	1.9	3.3	12.3

Table 1:2-6.—Standard errors for average mathematics proficiency scale scores for 9-, 13-, and 17-year-olds, by selected characteristics: 1978, 1982, and 1986—Continued (table 1:2-3)

Selected characteristic	1978	1982	1986
Age 17 (cont.)			
Describe your grades			
Mostly A	—	1.4	2.1
Half A's/half B's	—	1.5	2.2
Mostly B	—	0.9	1.9
Half B's/half C's	—	1.2	1.0
Mostly C	—	1.2	1.3
Half C's/half D's	—	1.2	2.7
Mostly D	—	2.0	4.5
Mostly below D	—	3.9	6.6
Missing	—	3.1	3.2
High school program			
General	—	1.1	1.0
Academic/college prep	—	1.0	1.2
Vocational/technical	—	1.3	1.7
Taken computer programming?			
Have	2.1	1.4	1.6
Have not	1.0	1.1	0.9
Highest level math taken			
Pre-algebra (or less)	0.9	1.0	0.9
Algebra (1st year)	0.8	1.2	1.2
Geometry	0.7	1.0	1.4
Algebra (2nd year)	0.8	0.9	1.2
Calculus	1.5	2.0	3.0
Something else	1.8	2.0	4.9

—Not available.

SOURCE: National Assessment of Educational Progress, *The Mathematics Report Card: Are We Measuring Up?*, 1988.

Supplemental note 1:2.–Trends in mathematics performance

The 1985–86 National Assessment of Educational Progress (NAEP) mathematics assessment was administered to students at age 9/grade 3, age 13/grade 7, and age 17/grade 11. For this assessment, birth date ranges for eligible 9-, 13-, and 17-year-olds were defined as October 1 through September 30 for each age level, rather than the calendar year used previously for 9- and 13-year-olds.

The 1985–86 assessment design was based on a variant of matrix sampling called Balanced Incomplete Block (BIB) spiralling. The entire assessment battery (including reading and science, as well as mathematics) was divided into blocks requiring approximately 15 minutes each, and each student was administered a booklet containing three blocks as well as a 6-minute block of background questions. The spiralling part of the method cycles the booklets for administration so that typically only a few students in any assessment session receive the same booklet. Each assessment session lasted about 1 hour.

For the portion of the assessment designed to measure trends, students were administered previously assessed mathematics questions according to the procedures used in prior assessments. Sixty-eight questions were given at age 9, 98 at age 13, and 94 at age 17, with each of the booklets accompanied by a paced audio recording of the questions as was done in the first three assessments. None of the students at any age were administered the full set of questions. Nine- and 13-year-olds were administered three booklets containing mathematics trend items and 17-year-olds were administered two booklets.

Samples sizes for the trend results are:

Age	1978	1982	1986
9	14,752	12,038	6,932
13	24,209	15,758	6,200
17	26,756	16,319	3,868

Beginning with the 1986 assessment, Item Response Theory (IRT) methodology was used to estimate levels of mathematics achievement. IRT defines the probability of answering a given item correctly as a mathematical function of proficiency level or skill and certain characteristics of the item. NAEP uses a three-parameter logistic model to estimate proficiency. With IRT technology, the performance of a sample of students in a learning area or subarea can be summarized on a single scale, even if different students have been administered different exercises.

The mathematics proficiency scale ranges from 0 to 500 with a standard deviation of 50. The levels chosen for describing results are 150, 200, 250, 300, and 350. Each level is defined by describing the types of mathematics questions that most students attaining that proficiency level would be able to solve successfully. The guideline used to select such questions was that students at any given level would have at least a 70 to 80 percent probability of success with these mathematics questions, while students at the next lower level would have less than a 40 to 50 percent probability of success. The scale levels are described as follows:

> 150 level—*Simple arithmetic facts*
>
> Learners at this level know some basic addition and subtraction facts and can add two-digit numbers without regrouping (carrying). They recognize simple situations in which addition and subtraction apply. They also are developing rudimentary classification skills.
>
> 200 level—*Beginning skills and understanding*
>
> Students at this level have considerable understanding of two-digit numbers. They can add two-digit numbers, but are still developing an ability to regroup in subtraction. They know relations among coins, can read information from charts and graphs, and use simple measurement instruments. They are developing some reasoning skills.
>
> 250 level—*Basic operations and problem solving*
>
> Students at this level have an initial understanding of the four basic operations. They are able to add and subtract whole numbers and apply these skills to one-step word problems and money situations. In multiplication, they can find the product of a two-digit and a one-digit number. They can also compare information from graphs and charts and are developing an ability to analyze simple logical relations.
>
> 300 level—*Moderately complex procedures and reasoning*
>
> Students at this level are developing an understanding of number systems. They can compute with decimals, simple fractions, and commonly encountered percents. They can identify geometric figures, measure lengths and angles, and calculate areas of rectangles. These students are also able to interpret simple inequalities, evaluate formulas, and solve simple linear equations. They can find averages, make deci-

> sions on information drawn from graphs, and use logical reasoning to solve problems. They are developing the skills to operate with signed numbers, exponents, and square roots.
>
> 350 level—*Multi-step problem solving and algebra*
>
> Students at this level can apply a range of reasoning skills to solve multi-step problems. They can solve routine problems involving fractions and percents, recognize properties of basic geometric figures, and work with exponents and square roots. They can solve a variety of two-step problems using variables, identify equivalent algebraic expressions, and solve linear equations and inequalities. They are developing an understanding of functions and coordinate systems.

The 1973 mathematics assessment was not included in the scaling of NAEP trend data. However, NAEP computed a rough estimate of the 1973 mean level of mathematics proficiency by assuming a non-negative, linear trend relationship, within a given age level, between the natural logarithm of a group's mean p-value level and its respective mathematics proficiency mean. For each age level, a mean p-value estimate using a common set of items was available for 1973, 1978, and 1982. Proficiency means for 1978 and 1982 were regressed on the respective proficiency means for these 2 years. The linear equation obtained from this regression was used to extrapolate to the 1973 proficiency mean by inserting the 1973 mean p-value into the equation.

The standard error, computed using a jackknife replication procedure, provides an estimate of sampling reliability for NAEP measures. NAEP uses the jackknife methodology to estimate the sampling variability of all reported statistics because conventional formulas for estimating standard errors of sampling statistics are inappropriate for use with NAEP's complex sampling procedures.

SOURCE: National Assessment of Educational Progress, *The Mathematics Report Card: Are We Measuring Up?*, 1988.

Indicator 1:3

Table 1:3-1. – U.S. history item responses: 1986

More than 80 percent answered correctly:	Percent correct
Thomas Edison invented the light bulb	95.2
Location of the Soviet Union on a map	92.1
Alexander Graham Bell invented the telephone	91.1
George Washington was President between 1780-1800	87.9
Location of Italy on a map	87.7
The Underground Railroad was a network for helping slaves escape	87.5
Adolf Hitler was the leader of Germany when the U.S. entered World War II	87.4
Thomas Jefferson was the primary author of the Declaration of Independence	87.4
The assembly line was introduced in the U.S. automobile industry	87.2
Locate on a map the area representing the 13 original States	84.8
The Ku Klux Klan used violence to oppose equality for minorities	83.9
Harriet Tubman was a leader in helping slaves escape to the North	83.8
Bill of Rights guarantees freedom of speech and religion	81.3
Location of the Rocky Mountains on a map	81.3
The Japanese attack on Pearl Harbor led the U.S. into World War II	80.0

Less than 30 percent answered correctly:	Percent correct
Andrew Jackson was President between 1820-1840	29.9
The Reformation led to the establishment of Protestant groups	29.8
The United Nations was founded between 1934-1947	25.9
The Seneca Falls Declaration was concerned with women's rights	25.8
Abraham Lincoln was President between 1860-1880	24.7
Medicare and the Voting Act were passed under Lyndon Johnson's Great Society	23.9
Betty Friedan and Gloria Steinem: leaders in the women's movement	22.8
Progressive movement refers to the period after World War I	22.6
Reconstruction refers to the readmission of the Confederate States	21.4
John Winthrop and the Puritans founded a colony at Boston	19.5

SOURCE: National Assessment of Educational Progress, *Literature and U.S. History: The Instructional Experience and Factual Knowledge of High School Juniors*, 1987.

Table 1:3-2. – Literature item responses: 1986

More than 80 percent answered correctly:	Percent correct
Noah gathered pairs of creatures onto the Ark	94.0
Moses led the people out of Egypt and gave the 10 Commandments	92.3
Romeo and Juliet's love was hindered by their feuding families	89.7
"I have a dream . . ." from a speech by Martin Luther King, Jr.	88.1
Hamlet said, "To be or not to be: that is the question."	87.8
In "A Christmas Carol," Ebenezer Scrooge became generous	87.2
Zeus was the ruler of the gods in Greek mythology	86.7
The White Rabbit and Mad Hatter are characters in *Alice in Wonderland*	86.1
Robin Hood was known for stealing from the rich to give to the poor	85.7
Cinderella's rags turned into a gown and she met a prince	85.1
"The Lord is my shepherd . . ." is from Psalm 23	82.4
Huckleberry Finn is about an orphaned boy and a runaway slave	80.5
Merlin was the magician in the legend of King Arthur	80.5

Less than 30 percent answered correctly:	Percent correct
D.H. Lawrence wrote "The Rocking Horse Winner," *Sons and Lovers*	28.7
Willa Cather wrote *My Antonia, Death Comes for the Archbishop*	28.2
Tennessee Williams wrote *A Streetcar Named Desire*	27.6
Ernest Hemingway wrote "In Another Country," "The Killers"	27.3
Thomas Hardy wrote *Return of the Native*	24.4
In *Catcher in the Rye*, a 16-year-old boy goes to New York	22.5
Henry James wrote about American compared to European lives	21.9
Henrik Ibsen wrote *Hedda Gabler, A Doll's House*	20.3
Joseph Conrad wrote *Heart of Darkness*	19.3
Invisible Man describes a young man's move to Harlem	18.3
Fyodor Dostoevski wrote *Crime and Punishment*	17.1
James Joyce is the author of *Ulysses* and *A Portrait of the Artist as a Young Man*	15.6
De Tocqueville wrote about what he saw in *Democracy in America*	15.5
Eudora Welty and Flannery O'Connor are known for stories set in the American South	14.4
The animal referred to in William Blake's poem is a tiger	13.6
The Pilgrim's Progress is an allegory about Christians	13.4

SOURCE: National Assessment of Educational Progress, *Literature and U.S. History: The Instructional Experience and Factual Knowledge of High School Juniors*, 1987.

Table 1:3-3.—Average scores on the U.S. history and literature scales for high school juniors, by selected characteristics: 1986

Selected characteristics	Scale	
	History	Literature
	Average scores*	
Total	285.0	285.0
Race/ethnicity		
White	290.8	289.9
Black	263.1	267.5
Hispanic	262.5	264.8
Sex		
Male	290.7	282.8
Female	279.0	287.3
Region		
Northeast	293.8	293.0
Southeast	278.4	282.6
Central	286.8	284.3
West	280.2	280.4
Size/type of community		
Rural	275.1	273.7
Urban disadvantaged	262.0	265.2
Urban advantaged	301.1	301.4
School program		
Academic	298.8	298.7
General	271.4	271.7
Vocational/technical	266.3	265.9
Parents' level of education		
No high school diploma	260.8	266.2
Graduated high school	273.8	273.4
Post high school	289.7	288.3
Graduated college	297.7	297.6
Reading materials in the home		
0-3 types	265.1	265.4
4 types	279.6	279.3
5 types	291.6	291.7

*The history and literature scales range from 0 to 500.

SOURCE: National Assessment of Educational Progress, *Literature and U.S. History: The Instructional Experience and Factual Knowledge of High School Juniors*, 1987.

Table 1:3-4.—Standard errors for average scores on the U.S. history and literature scales for high school juniors, by selected characteristics: 1986 (table 1:3-3)

Selected characteristics	Scale History	 Literature
	Average scores	
Total	1.3	1.0
Race/ethnicity		
White	1.6	1.3
Black	1.2	1.2
Hispanic	1.5	1.6
Sex		
Male	1.5	1.3
Female	1.3	1.1
Region		
Northeast	2.8	2.9
Southeast	2.6	2.2
Central	3.3	2.1
West	1.1	1.0
Size/type of community		
Rural	3.5	3.3
Urban disadvantaged	3.5	2.8
Urban advantaged	3.1	2.9
School program		
Academic	1.2	1.2
General	1.4	1.0
Vocational/technical	2.5	1.6
Parents' level of education		
No high school diploma	1.3	1.6
Graduated high school	1.3	1.2
Post high school	1.5	1.5
Graduated college	1.6	1.4
Reading materials in the home		
0–3 types	1.7	.6
4 types	1.6	1.3
5 types	1.3	1.1

SOURCE: National Assessment of Educational Progress, *Literature and U.S. History: The Instructional Experience and Factual Knowledge of High School Juniors*, 1987.

Supplemental note 1:3.–Knowledge of U.S. history and literature

The 1985–86 National Assessment of Educational Progress (NAEP) U.S. history and literature assessment was administered to students at age 17 or in grade 11. The assessment design was based on a variant of matrix sampling called Balanced Incomplete Block (BIB) spiralling. The entire assessment battery (including reading, mathematics, and science) was divided into blocks approximately 15 minutes each, and each student was administered a booklet containing three blocks as well as a 6-minute block of background questions. Each assessment session lasted about 1 hour.

History and literature items were included in 4 of the 92 booklets administered to students at age 17/grade 11 in the 1986 assessment. Each of four booklets contained one block of history questions, one block of literature questions, and one block of reading questions. The history blocks each consisted of 34 to 36 content items and a common set of 25 history background and attitude items. The literature blocks contained 30 to 31 content items as well as 42 literature background and attitude items. All the history literature and questions were multiple-choice.

The four booklets containing the history and literature blocks were spiralled with the remaining NAEP booklets. This procedure cycled the booklets for administration so that typically no two students in any session received the same booklet. Thus a matrix sampling procedure was used for these four booklets, with no student administered more than one booklet. A nationally representative sample of nearly 2,000 11th grade students responded to each booklet and a total of 7,812 11th-graders were included in the analyses for both literature and U.S. history.

Analyses included computing the percentages of students giving various responses and using item response theory (IRT) technology to estimate knowledge levels for the Nation and various subpopulations. IRT methods were used to derive a history scale and a literature scale. These scales range from 0 to 500. For both the U.S. history and literature scales, the mean and standard deviation were set to 285 and 40, respectively. These values were chosen to be similar to the mean and standard deviation for 11th-graders on the 1983–84 (NAEP) reading scale.

The main purpose of IRT analysis is to provide a common scale on which performance can be compared across groups and subgroups, whether they are tested at the same time or a number of years apart. It allows NAEP to estimate performance for any group or subgroup, even though all respondents did not take all the exercises in the NAEP pool. Because the students responding to the U.S. history and literature questions received one of four non-overlapping sets of items for each of the two subject areas, it was necessary to assume that the four blocks of items within a subject area were equivalent samples of the content domain. NAEP considered this assumption reasonable, since the blocks were constructed to be parallel, and the assumption was supported by item analysis results. Because of the relatively large number of literature and U.S. history items administered to each student, reasonably precise estimates of knowledge levels could be obtained for individual respondents.

Another analysis of the NAEP U.S. history and literature assessment was performed by Diane Ravitch and Chester E. Finn, Jr., and reported in their book, *What Do Our 17-Year-Olds Know?* (Harper and Row, N.Y.), 1987. Ravitch and Finn scaled responses to each of the assessment items in order to assign a letter grade from A to F to each item. These letter grades were assigned according to the proportion of students who correctly responded to a given item. Scores between 90 and 100 percent correct were treated as As, between 80 and 90 percent correct as Bs, between 70 and 80 percent correct as Cs, between 60 and 70 percent correct as Ds, and scores below 60 were treated as Fs. Ravitch and Finn then calculated average grades for various subgroups of respondents and items. On this scale, the average student received an F on the history assessment by only giving correct responses to 54.5 percent of the questions that he or she attempted. Similarly, by answering only 51.8 percent of attempted questions, the average student also received a failing grade on the literature assessment.

SOURCE: National Assessment of Educational Progress, *Literature and U.S. History: The Instructional Experience and Factual Knowledge of High School Juniors*, 1987.

Indicator 1:6

Table 1:6-1.—Overall computer competence scores for students in grades 3, 7, and 11: School year ending 1986

Grade tested	Number of items	Grade level		
		3	7	11
		Mean percent correct		
Grade 3	58	55.7	—	—
Grade 7	101	—	61.5	—
Grade 11	125	—	—	66.5
Grades 3 and 7	41	50.8	66.3	—
Grades 7 and 11	65	—	49.8	57.8
Grades 3, 7, 11	26	38.7	55.5	64.8

— Not applicable.

SOURCE: National Assessment of Educational Progress, [illegible]

Table 1:6-2.—Computer competence scores for students in grades 3, 7, and 11, by computer use, study or ownership: School year ending 1986

Type of experience	Grade level 3	 7	 11
	Mean percent correct		
Have used a computer			
Yes	[illegible]	[illegible]	[illegible]
No	[illegible]	[illegible]	[illegible]
Are currently studying computers			
Yes	[illegible]	[illegible]	[illegible]
No	[illegible]	[illegible]	[illegible]
Family owns computer			
Yes	[illegible]	[illegible]	[illegible]
No	[illegible]	[illegible]	[illegible]

NOTE: Scores do not have equivalent meanings across grade levels.

SOURCE: National Assessment of Educational Progress, Computer Competence: The First National Assessment, draft final report, December 1987.

Table 1:6-3.—Computer competence scores for students in grades 7 and 11, by home and school experiences: School year ending 1986

Family ownership/ study status	Grade level	
	7	11
	Mean percent correct	
Owns, is studying	57.2	68.3
Owns, is not studying	50.3	64.2
Does not own, is studying	53.6	61.3
Does not own, is not studying	51.6	57.6

NOTE: Scores do not have equivalent meanings across grade levels.

SOURCE: National Assessment of Educational Progress, Computer Competence: The First National Assessment, [illegible]

Table 1:6-6.—Standard errors for overall computer competence scores for students in grades 3, 7, and 11: School year ending 1986 (table 1:6-1)

Grade tested	Number of items	Grade level		
		3	7	11
Grade 3	59	0.3	—	—
Grade 7	131	—	0.3	—
Grade 11	125	—	—	0.4
Grades 3 and 7	44	.3	.4	—
Grades 7 and 11	65	—	.3	.4
Grades 3, 7, 11	28	.3	.4	.5

—Not applicable.

SOURCE: National Assessment of Educational Progress, *Computer Competence: The First National Assessment*, draft final report, November 1987.

Table 1:4-5.—Standard errors for computer competence scores for students in grades 3, 7, and 11, by computer use, study, or ownership: School year ending 1986 (table 1:4-2)

Type of experience	Grade level		
	3	7	11
Have used a computer			
Yes	0.3	0.3	0.4
No	.4	.3	.4
Are currently studying computers			
Yes	.5	.6	1.1
No	.3	.2	.3
Family owns computer			
Yes	.7	.6	.7
No	.3	.3	.3

NOTE: Scores do not have equivalent meanings across grade levels.

SOURCE: National Assessment of Educational Progress, *Computer Competence: The First National Assessment*, draft final report, November 1987.

Table 1:4-6.—Standard errors for computer competence scores for students in grades 7 and 11, by home and school experience: School year ending 1986 (table 1:4-3)

Family ownership/ study status	Grade level 7	Grade level 11
	Mean percent correct	
Owns/is studying	1.2	0.7
Owns/is not studying	.6	.4
Does not own/is studying	.4	.5
Does not own/is not studying	.3	.3

NOTE: Scores do not have equivalent meanings across grade levels.

SOURCE: National Assessment of Educational Progress, *Computer Competence: The First National Assessment*, draft final report, November 1987.

Table 1:5-1.—Scholastic Aptitude Test (SAT) scores: School years ending 1963–1987

Year[1]	Total	Verbal	Math	Year[1]	Total	Verbal	Math
	Average test scores				Average test scores		
1963	980	478	502	1975	906	434	472
1964	973	475	498	1976	903	431	472
1965	969	473	496	1977	899	429	470
1966	967	471	496	1978	897	429	468
1967	958	466	492	1979	894	427	467
1968	958	466	492	1980	890	424	466
1969	956	463	493	1981	890	424	466
1970	948	460	488	1982	893	426	467
1971	943	455	488	1983	893	425	468
1972	937	453	484	1984	897	426	471
1973	926	445	481	1985	906	431	475
1974	924	444	480	1986	906	431	475
				1987	906	430	476

[1] Averages for 1972 through 1986 are based on college-bound seniors. Averages for 1963 through 1971 are estimates provided by the College Board; background information needed for specific identification of college-bound seniors was not collected before 1972.

SOURCE: College Entrance Examination Board, National Report: College-Bound Seniors, various years.

Table 1:5-2. – American College Testing (ACT) scores: School years ending 1970-1987

Year	Composite	English	Mathematics	Social studies	Natural sciences
			Average test scores		
1970	19.9	18.5	20.0	19.7	20.8
1971	19.2	18.0	19.1	18.7	20.5
1972	19.1	17.9	18.8	18.6	20.6
1973	19.2	18.1	19.1	18.3	20.8
1974	18.9	17.9	18.3	18.1	20.8
1975	18.6	17.7	17.6	17.4	21.1
1976	18.3	17.5	17.5	17.0	20.8
1977	18.4	17.7	17.4	17.3	20.9
1978	18.5	17.9	17.5	17.1	20.9
1979	18.6	17.9	17.5	17.2	21.1
1980	18.5	17.9	17.4	17.2	21.1
1981	18.5	17.8	17.3	17.2	21.0
1982	18.4	17.9	17.2	17.3	20.8
1983	18.3	17.8	16.9	17.1	20.9
1984	18.5	18.1	17.3	17.3	21.0
1985	18.6	18.1	17.2	17.4	21.2
1986	18.8	18.5	17.3	17.6	21.4
1987	18.7	18.4	17.2	17.5	21.4

SOURCE: The American College Testing Program, *The High School Profile Report, Normative Data*, various years.

Table 1:5-3.—Scholastic Aptitude Test (SAT) scores, by control of high school: Selected school years ending 1981-1987

Year and control	Verbal	Math
	Median scores	
1981		
Public	420	467
Private	431	466
1982		
Public	423	469
Private	437	468
1983		
Public	421	467
Private	435	467
1984		
Public	423	469
Private	437	469
1985		
Public	427	475
Private	441	474
1987		
Public	428	476
Religiously affiliated	440	469
Independent	473	519

SOURCE: College Entrance Examination Board, *Profiles, College-Bound Seniors*, various years.

Table 1:5-4.—American College Testing (ACT) scores, by control of high school: Selected school years ending 1982-1987

Mean ACT scores	Composite	English	Math	Social studies	Natural sciences
1981-82					
Public	18.4	17.6	17.1	17.2	20.8
Private, non-Catholic	19.0	18.7	17.6	18.0	21.2
Catholic	19.1	18.6	17.9	18.2	21.2
1982-83					
Public	18.2	17.7	16.9	17.0	20.9
Private, non-Catholic	18.9	18.7	17.4	17.8	21.2
Catholic	19.1	18.7	17.7	18.1	21.3
1984-85					
Public	18.4	18.0	17.0	17.2	21.0
Private, non-Catholic	18.9	18.8	17.4	17.8	21.3
Catholic	19.2	18.9	17.8	18.1	21.4
1986-87					
Public	18.7	18.4	17.2	17.5	21.4
Private, non-Catholic	19.1	19.1	17.3	18.0	21.4
Catholic	19.1	19.0	17.5	18.1	21.4

SOURCE: American College Testing Program, *Reference Norms for Spring [various years] ACT Tested H.S. Graduates*, various years, and unpublished data, 1987.

Table 1:5-5.—State tables of college entrance examination scores: 1982 and 1987

	High school graduates in 1987		High school graduates in 1982	
ACT State	Average ACT score[1]	Percent taking test[2]	Average ACT score	Percent taking test[3]
Alabama	18.0	53.0	17.2	55.3
Alaska	18.7	37.1	18.7	31.5
Arizona	19.3	38.2	18.7	41.2
Arkansas	17.8	56.9	17.7	56.3
Colorado	19.9	63.4	19.6	66.8
Idaho	19.0	55.6	18.9	55.2
Illinois	18.9	63.5	18.6	67.4
Iowa	20.3	60.8	20.3	54.5
Kansas	19.3	66.9	18.9	60.8
Kentucky	18.3	55.5	17.5	53.7
Louisiana	16.9	61.3	16.7	60.8
Michigan	18.8	58.4	18.7	51.4
Minnesota	20.2	35.7	20.2	26.9
Mississippi	16.3	65.3	15.5	74.4
Missouri	19.2	54.8	18.7	45.3
Montana	19.9	52.7	19.5	49.5
Nebraska	19.8	65.9	19.9	73.0
Nevada	19.1	40.5	18.3	44.5
New Mexico	18.0	53.9	17.6	56.5
North Dakota	18.8	68.3	17.8	64.5
Ohio	19.3	49.6	19.0	49.2
Oklahoma	17.7	54.9	17.6	51.4
South Dakota	19.6	65.9	19.1	61.7
Tennessee	18.0	61.9	17.5	56.3
Utah	18.9	67.2	18.4	66.4
West Virginia	17.6	50.2	17.4	48.5
Wisconsin	20.4	42.1	20.4	32.0
Wyoming	19.9	62.7	19.2	52.2

Table 1:5-5.—State tables of college entrance examination scores: 1982 and 1987—Continued

SAT State	High school graduates in 1987		High school graduates in 1982	
	Average SAT score	Percent taking test[2]	Average SAT score	Percent taking test[3]
California	906	46.2	899	38.4
Connecticut	912	71.6	896	69.1
Delaware	910	63.5	897	53.4
Dist. of Col.	842	55.8	821	53.2
Florida	893	47.6	889	37.5
Georgia	840	59.8	823	49.1
Hawaii	881	54.8	857	47.2
Indiana	874	54.1	860	47.1
Maine	899	58.5	890	47.6
Maryland	914	58.6	889	50.3
Massachusetts	909	70.0	888	65.6
New Hampshire	938	65.0	925	56.4
New Jersey	892	70.1	869	64.7
New York	894	69.8	896	61.6
North Carolina	838	55.7	827	46.6
Oregon	928	50.7	908	41.7
Pennsylvania	891	58.5	885	51.4
Rhode Island	898	61.0	877	60.7
South Carolina	832	53.4	790	48.3
Texas	875	44.8	868	32.4
Vermont	914	63.9	904	54.2
Virginia	907	62.3	888	51.0

[1] ACT scores and the percentages of graduates taking the exam may not be strictly comparable between 1987 and 1982. The 1987 scores and number of test takers represent data for students who took the ACT exam as seniors, and for those who took the test as juniors but did not take it again when they were seniors. Prior years' scores and numbers of test takers included all test takers.

[2] The 1987 estimated percentage of high school graduates taking the ACT or SAT was calculated by dividing the number of 1987 ACT or SAT test takers by the number of 1986 public and 1980 private high school graduates. The number of 1987 high school graduates was not available, nor were later data on private school graduates.

[3] The 1982 estimated percentage of high school graduates taking the ACT or SAT was calculated by dividing the number of 1982 ACT or SAT test takers by the number of 1982 public and 1980 private high school graduates.

SOURCE: U.S. Department of Education, Office of Planning, Budget and Evaluation, *State Education Statistics*, 1987.

Indicator 1:5

Table 1:5-6.—Average scores on the Preliminary Scholastic Aptitude Test: School years ending 1959–1986

Year	Verbal score	Mathematics score
1959	41.2	45.0
1960	40.9	44.8
1961	42.3	46.1
1962	42.9	46.5
1963	43.3	45.6
1964	42.9	44.7
1965	42.2	45.9
1966	42.7	45.0
1967	42.0	44.5
1968	42.6	45.6
1969	42.2	45.0
1970	41.4	46.1
1971	42.2	45.2
1972	42.7	46.9
1973	41.8	45.5
1974	41.6	45.9
1975	41.0	45.5
1976	40.5	45.0
1977	39.9	44.2
1978	40.6	44.8
1979	40.2	45.3
1980	40.6	45.1
1981	41.5	45.1
1982	41.0	44.7
1983	40.9	44.7
1984	41.0	44.2
1985	40.9	45.0
1986	40.9	45.0
1987	40.4	45.0

SOURCE: College Board and National Merit Scholarship Corp. *Preliminary Scholastic Aptitude Test/National Merit Scholarship Qualifying Test October Administrations*, unpublished data, 1987.

Table 1:6-1.—American College Testing (ACT) average scores, by subject and number of courses taken in subject: 1985

Subject	Total	Number of courses taken in subject* 1	2	3	4	5	6	7
		Average scores						
English	18.6	15.2	16.7	17.3	18.7	19.0	—	—
Mathematics	17.5	9.3	11.3	15.1	18.7	22.0	24.3	26.5
Social studies	17.8	15.2	17.0	17.9	18.2	18.5	18.4	18.3
Natural science	21.5	17.4	19.3	22.6	25.4	—	—	—

— Insufficient number of students for analysis.

*Courses may have been taken for one term or full year.

SOURCE: J. Laing, H. Engen, and J. Maxey, "The Relationship of High School Coursework to the Corresponding ACT Assessment Scores," *ACT Research Report 87-3*, 1987.

Table 1:6-2.—Standard deviations (and number of test-takers) for average American College Testing (ACT) scores, by subject and number of courses taken in subject: 1985 (table 1:6-1)

Subject	Number of courses taken in subject							
	Total	1	2	3	4	5	6	7
English	5.1	5.3	5.4	5.2	5.0	5.0	–	–
	(31,419)	(223)	(150)	(2,561)	(19,283)	(8,521)		
Mathematics	7.6	9.3	5.5	6.2	6.2	5.8	5.1	5.1
	(31,400)	(2,085)	(3,648)	(6,657)	(7,715)	(6,025)	(3,119)	(771)
Social studies	7.0	6.9	7.1	7.0	6.9	6.7	6.7	5.9
	(31,142)	(769)	(4,983)	(10,342)	(8,832)	(4,040)	(1,197)	(240)
Natural science	6.1	5.3	5.6	5.7	5.3	–	–	–
	(31,148)	(2,676)	(10,134)	(11,439)	(6,077)			

—Insufficient number of students for analysis.

SOURCE: J. Laing, H. Engen, and J. Maxey, "The Relationship of High School Coursework to the Corresponding ACT Assessment Scores," *ACT Research Report 87-3*, 1987.

Indicator 1:6

Supplemental note 1:6.–Academic coursework and achievement

The data for this indicator are based on a 20 percent random sample of seniors taking the American College Testing (ACT) Program on the October 1985 test date.

In the fall of 1985, the ACT expanded the collection of information on high school courses taken by students completing the ACT Assessment. Students were asked to indicate which of 30 secondary-level courses they had taken or planned to take before graduating from high school. The particular courses listed include those that customarily form the basis of a college preparatory (academic or "core") high school curriculum and are frequently required or recommended for admission to postsecondary institutions. They were selected to give a relatively complete picture of a student's basic academic preparation. The courses listed in the four subject areas represented in the ACT tests were:

English
English taken during the 9th grade
English taken during the 10th grade
English taken during the 11th grade
English taken during the 12th grade
Speech

Mathematics
First-year algebra (algebra I, not pre-algebra)
Second-year algebra (algebra II)
Geometry
Trigonometry
Calculus (not pre-calculus)
Other math beyond algebra II
Computer math/computer science

Natural science
General/physical/earth science
Biology
Chemistry
Physics

Social studies
U.S. history (American history)
World history/world civilization
Other history (European, State, etc.)
American government/civics
Economics (consumer economics)
Geography
Psychology

Table 1:7-1.—High school completion of persons aged 18–19 and 20–24, by race and Hispanic origin: 1974–1986

	Age 18 to 19				Age 20 to 24			
Year	Total	White	Black	Hispanic*	Total	White	Black	Hispanic*
				Percent of age group				
1974	73.4	76.2	55.8	48.9	83.9	85.6	72.5	59.0
1975	73.7	77.0	52.8	50.0	83.9	85.9	70.5	61.3
1976	73.1	75.4	58.2	50.9	83.7	85.4	71.9	58.0
1977	72.9	75.7	54.9	50.7	83.7	85.1	73.4	56.6
1978	73.5	76.3	54.9	48.9	83.7	85.2	73.5	58.7
1979	72.8	75.3	56.4	53.7	83.2	84.9	71.8	55.8
1980	73.7	76.1	59.3	46.1	83.8	85.1	74.3	57.1
1981	72.5	74.8	59.6	47.2	83.7	85.0	75.7	59.3
1982	72.0	74.5	58.2	51.7	84.1	85.4	76.2	60.2
1983	72.7	75.6	59.1	50.3	83.3	84.6	75.8	56.6
1984	73.3	75.5	63.0	58.3	84.6	85.7	79.3	60.7
1985	74.6	76.7	62.8	49.8	85.3	86.0	80.8	67.4
1986	74.6	76.6	64.9	54.7	84.8	85.4	81.0	61.6

*Most of the year-to-year differences in completion rates for Hispanics are not statistically significant due to the small size of the Hispanic sample. Hispanics may be of any race.

NOTE: Separate analyses were not done for Asians because they are not identifiable from the October Current Population Survey data tapes.

SOURCE: U.S. Department of Commerce, Bureau of the Census, "School Enrollment—Social and Economic Characteristics of Students, October [various years]," *Current Population Reports*, Series P-20; and unpublished tabulations.

Table 1:7-2.—High school completion of persons aged 25–34, by race and Hispanic origin: 1974–1986

Year	Total	White	Black	Hispanic*
		Percent of age group		
1974	81.1	82.6	68.4	49.2
1975	81.9	83.6	67.5	53.4
1976	82.3	83.6	71.4	51.5
1977	83.6	84.9	72.0	56.2
1978	84.6	85.9	74.4	55.0
1979	85.0	86.3	74.7	54.3
1980	85.4	86.7	76.4	56.1
1981	85.9	86.8	78.6	54.9
1982	86.3	87.3	79.7	56.6
1983	86.7	87.6	80.2	57.5
1984	86.8	87.9	79.9	58.9
1985	86.3	87.2	80.7	59.4
1986	86.5	87.4	80.1	60.0

*Hispanics may be of any race.

NOTE: For any given year, 18- to 19-, 20- to 24-, and 25- to 34-year-olds represent different groups of people. Therefore, these tables should be used with caution when attempting to make inferences about the completion rates of a specific group as it ages. Separate analyses were not done for Asians because they are not identifiable from the October Current Population Survey data tapes.

SOURCE: U.S. Department of Commerce, Bureau of the Census, "School Enrollment—Social and Economic Characteristics of Students, October [various years]," *Current Population Reports*, Series P-20.

Table 1:8-1.—Total and current expenditure per pupil in average daily attendance in public elementary and secondary schools: Selected school years ending 1950–1987

	Current dollars		Constant 1985–86[1] dollars	
Year	Total expenditure per pupil[2]	Current expenditure per pupil[3]	Total expenditure per pupil[2]	Current expenditure per pupil[3]
1950	$ 259	$ 209	$1,190	$ 960
1952	313	244	1,295	1,010
1954	351	265	1,420	1,072
1956	388	294	1,571	1,190
1958	449	341	1,709	1,298
1960	472	375	1,748	1,389
1962	530	419	1,918	1,516
1964	559	460	1,971	1,622
1966	654	537	2,229	1,830
1968	786	658	2,514	2,105
1970	955	816	2,751	2,351
1972	1,128	990	2,983	2,618
1974	1,364	1,207	3,182	2,816
1976	1,697	1,504	3,329	2,950
1977	1,816	1,638	3,367	3,037
1978	2,002	1,823	3,478	3,167
1979	2,210	2,021	3,510	3,210
1980	2,491	2,272	3,492	3,184
1981	[4]2,762	2,487	[4]3,470	3,125
1982	[4]2,997	2,726	[4]3,465	3,152
1983	[4]3,230	2,955	[4]3,580	3,276
1984	[4]3,500	3,173	[4]3,742	3,393
1985	[4]3,760	3,470	[4]3,869	3,571
1986	[4]4,070	3,752	[4]4,070	3,752
1987	[4]4,300	—	[4]4,206	—

— Data not available.

[1] Based on the Consumer Price Index, prepared by the Bureau of Labor Statistics, U.S. Department of Labor, and adjusted to a school-year basis.

[2] Total expenditure includes all current expenditures, capital outlay and interest on school debt.

[3] Current expenditure includes expenditures for operating local public schools, excluding captital outlay and interest on debt.

[4] Estimated.

NOTE: Some data revised from previously published figures.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Statistics of State School Systems* and *Revenues and Expenditures for Public Elementary and Secondary Education*, various years; Common Core of Data survey; and unpublished data. National Education Association, *Estimates of School Statistics*, various years, copyrighted.

Table 1:8-2.—Current expenditure per pupil in average daily attendance in public elementary and secondary schools, by State: School years ending 1970 and 1986

State	Expenditure per pupil (1985–86 dollars) 1970	Expenditure per pupil (1985–86 dollars) 1986	Percent increase	State	Expenditure per pupil (1985–86 dollars) 1970	Expenditure per pupil (1985–86 dollars) 1986	Percent increase
United States	$2,351	$3,752	59.6	Missouri	$2,041	$3,189	56.2
Alabama	1,567	2,565	63.6	Montana	2,253	4,091	81.6
Alaska	3,234	8,253	155.2	Nebraska	2,122	3,634	71.3
Arizona	2,075	3,093	49.1	Nevada	2,217	3,440	55.2
Arkansas	1,635	2,658	62.5	New Hampshire	2,083	3,542	70.0
California*	2,498	3,543	41.8	New Jersey	2,928	5,395	84.3
Colorado	2,126	3,975	87.0	New Mexico	2,037	3,195	56.9
Connecticut	2,741	4,743	73.1	New York	3,823	6,011	57.3
Delaware	2,593	4,610	77.8	North Carolina	1,764	2,982	69.0
District of Columbia	2,934	5,337	81.9	North Dakota	1,987	3,481	75.2
Florida	2,110	3,529	67.3	Ohio	2,103	3,527	67.7
Georgia	1,694	2,966	75.1	Oklahoma	1,742	3,146	80.7
Hawaii	2,422	3,807	57.2	Oregon	2,664	4,141	55.4
Idaho	1,738	2,484	42.9	Pennsylvania	2,540	4,416	73.8
Illinois	2,620	3,781	44.3	Rhode Island	2,568	4,667	81.8
Indiana	2,097	3,275	56.2	South Carolina	1,765	3,058	73.3
Iowa	2,432	3,619	48.8	South Dakota	1,988	3,051	53.5
Kansas	2,221	3,829	72.4	Tennessee	1,631	2,612	60.2
Kentucky	1,571	2,486	58.3	Texas	1,798	3,298	83.4
Louisiana	1,867	3,187	70.7	Utah	1,804	2,390	32.5
Maine	1,995	3,472	74.0	Vermont	2,326	4,031	73.3
Maryland	2,646	4,450	68.2	Virginia	2,039	3,520	72.6
Massachusetts	2,475	4,562	84.3	Washington	2,637	3,881	47.2
Michigan	2,604	4,176	60.3	West Virginia	1,930	3,528	82.8
Minnesota	2,603	3,941	51.4	Wisconsin	2,543	4,168	63.9
Mississippi	1,443	2,362	63.7	Wyoming	2,466	5,114	107.4

*Estimated by the Center for Education Statistics.

NOTE: 1985–86 dollars are based on the Consumer Price Index, prepared by the Bureau of Labor Statistics, U.S. Department of Labor. These data do not reflect differences in inflation rates from State to State.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Statistics of State School Systems*; and Common Core of Data survey, special tabulations.

Table 1:9-1.—Revenue sources for public elementary and secondary schools: Selected school years ending 1920–1987

Year	Total revenues[1]	Sources		
		Local[2]	State	Federal
	(In thousands)	Percent of total		
1920	$ 970,121	83.2	16.5	0.3
1930	2,088,557	82.7	16.9	0.4
1940	2,260,527	68.0	30.3	1.8
1950	5,437,044	57.3	39.8	2.9
1960	14,746,618	56.5	39.1	4.4
1970	40,266,923	52.1	39.9	8.0
1971	44,511,292	52.5	39.1	8.4
1972	50,003,645	52.8	38.3	8.9
1973	52,117,930	51.3	40.0	8.7
1974	58,230,892	50.1	41.4	8.5
1975	64,445,239	48.8	42.2	9.0
1976	71,206,073	46.5	44.6	8.9
1977	75,322,532	47.8	43.4	8.8
1978	81,443,160	47.6	43.0	9.4
1979	87,994,143	44.6	45.6	9.8
1980	96,881,165	43.4	46.8	9.8
1981	105,949,087	43.4	47.4	9.2
1982	110,191,257	45.0	47.6	7.4
1983	117,497,502	45.0	47.9	7.1
1984	126,055,419	45.4	47.8	6.8
1985[3]	137,294,678	44.4	48.9	6.6
1986[3]	149,004,882	43.9	49.5	6.7
1987[4]	160,908,262	43.8	50.0	6.2

[1] In current dollars.

[2] Includes intermediate sources.

[3] Revised from previously published figures.

[4] Preliminary data from the National Education Association.

NOTE: Percents may not add to 100 due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1988* (based on Common Core of Data survey and its predecessors). National Education Association, *Estimates of School Statistics, 1986–87*, 1987, copyrighted.

Indicator 1:10

Table 1:10-1.—National index of public school revenues per pupil in relation to per capita income: Selected school years ending 1930–1987

Year	National index	Total education revenues (current dollars, in thousands)	Public elementary and secondary enrollment (in thousands)	Per pupil education revenues (current dollars)	Total personal income (current dollars, in thousands)	Total population (in thousands)	Per capita personal income (current dollars)
1930	11.667	$ 2,088,557	25,678	$ 81.34	$ 84,894,000	121,770	$ 697.17
1940	16.089	2,260,527	25,434	88.88	72,301,000	130,880	552.42
1950	15.708	5,437,044	25,111	216.52	204,918,000	148,665	1,378.39
1960	18.920	14,746,618	36,087	408.64	382,550,000	177,124	2,159.79
1970	24.217	40,266,923	45,619	882.68	766,522,000	210,298	3,644.93
1980	25.754	96,881,165	41,645	2,326.36	2,028,510,000	224,569	9,032.90
1981	26.061	105,949,087	40,987	2,584.94	2,254,076,000	227,255	9,918.71
1982	25.099	110,191,257	40,099	2,747.98	2,514,231,000	229,637	10,948.72
1983	25.810	117,497,502	39,652	2,963.22	2,663,498,000	231,996	11,480.79
1984	26.478	126,055,419	39,352	3,203.28	2,834,375,000	234,284	12,098.03
1985	26.643	137,294,678	39,293	3,494.13	3,101,267,000	236,477	13,114.46
1986	27.105	149,004,882	39,530	3,769.41	3,320,099,000	238,741	13,906.70
1987	27.614	*160,908,262	39,801	4,042.82	3,529,522,000	241,078	14,640.58

*Estimated by the National Education Association.

NOTE: Data have been substantially revised from previously published figures. Beginning in 1960, data include Alaska and Hawaii.

SOURCES: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1988* (based on Common Core of Data surveys, various years); and unpublished data. National Education Association, *Estimates of School Statistics, 1986–87,* 1987, copyrighted. U.S. Department of Commerce, Bureau of Economic Analysis, *State Personal Income: 1929–82,* 1984, and Regional Economic Information System, August 1987.

Table 1:10-2.—State indices of public school revenues per pupil in relation to per capita income: School years ending 1980 and 1987

State	State index 1980	State index 1987	State and local education revenues (thousands) 1987	Public elementary/ secondary enrollment, Fall 1986	Per pupil education revenues 1987	Total personal income (millions) 1986[1]	Total population (thousands) 1986[1]	Per capita personal income 1986[1]
Alabama	19.9	19.1	$ 1,585,200	733,735	$ 2,160	$ 45,939	4,052	$11,337
Alaska	34.3	44.9	861,279	107,973	7,977	9,495	534	17,781
Arizona	25.1	19.3	1,387,060	534,538	2,595	44,710	3,319	13,474
Arkansas	18.4	23.4	1,133,388	437,438	2,591	26,268	2,372	11,074
California	21.6	22.2	16,463,619	4,377,989	3,761	456,098	26,981	17,472
Colorado	26.9	28.6	2,433,400	558,415	4,358	49,771	3,267	15,234
Connecticut	18.6	27.6	2,531,800	468,847	5,400	62,502	3,189	19,599
Delaware	27.1	29.3	414,758	94,410	4,393	9,498	633	15,005
District of Columbia	20.2	23.1	384,004	85,612	4,485	12,142	626	19,396
Florida	22.0	26.3	6,200,067	1,607,320	3,857	170,980	11,675	14,645
Georgia	20.2	20.9	3,088,030	1,096,425	2,816	82,078	6,104	13,447
Hawaii	19.3	26.5	649,000	164,640	3,942	15,814	1,062	14,891
Idaho	20.6	22.3	522,515	208,391	2,507	11,250	1,002	11,228
Illinois	20.5	24.1	6,866,424	1,825,185	3,762	180,052	11,552	15,586
Indiana	18.8	27.4	3,480,974	966,780	3,601	72,294	5,504	13,135
Iowa	24.5	26.0	1,669,318	481,286	3,468	38,053	2,851	13,347
Kansas	24.7	26.4	1,607,567	416,091	3,863	36,042	2,460	14,651
Kentucky	18.4	24.0	1,733,600	642,778	2,697	41,902	3,729	11,237
Louisiana	21.2	26.2	2,333,500	795,188	2,935	50,382	4,501	11,194
Maine	22.0	25.9	701,053	211,752	3,311	15,007	1,173	12,794
Maryland	24.2	26.3	2,996,702	675,747	4,435	75,272	4,463	16,866
Massachusetts	31.0	24.5	3,625,950	833,918	4,348	103,353	5,832	17,722
Michigan	25.4	25.5	6,342,139	1,681,880	3,771	135,113	9,145	14,775
Minnesota	27.7	27.8	2,964,100	711,134	4,168	63,184	4,214	14,994
Mississippi	17.6	22.0	1,065,000	498,639	2,136	25,504	2,625	9,716
Missouri	21.0	23.6	2,605,709	800,606	3,255	69,856	5,066	13,789
Montana	28.2	34.6	625,932	153,327	4,082	9,666	819	11,802
Nebraska	23.5	23.4	860,567	267,139	3,221	21,957	1,598	13,740
Nevada	16.2	21.7	540,519	161,239	3,352	14,870	963	15,441
New Hampshire	14.7	22.3	579,954	163,717	3,542	16,339	1,027	15,909

Table 1:10-2.—State indices of public school revenues per pupil in relation to per capita income: School years ending 1980 and 1987—Continued

State	State index		State and local education revenues (thousands) 1987	Public elementary/ secondary enrollment, Fall 1986	Per pupil education revenues 1987	Total personal income (millions) 1986*	Total population (thousands) 1986*	Per capita personal income 1986*
	1980	1987						
New Jersey	29.1	31.9	$ 6,581,500	1,107,467	$ 5,943	$ 141,919	7,619	$ 18,627
New Mexico	25.2	27.3	880,451	281,943	3,123	16,894	1,479	11,423
New York	30.5	32.3	14,418,300	2,607,719	5,529	304,095	17,772	17,111
North Carolina	20.7	24.6	3,322,350	1,085,248	3,061	78,763	6,333	12,437
North Dakota	24.4	24.7	366,460	118,703	3,087	8,470	679	12,474
Ohio	22.1	25.4	6,340,000	1,793,508	3,535	149,807	10,752	13,933
Oklahoma	21.9	21.6	1,575,000	593,183	2,655	40,595	3,305	12,283
Oregon	25.9	29.0	1,734,300	449,307	3,860	35,955	2,698	13,327
Pennsylvania	26.2	33.3	7,935,100	1,674,161	4,740	169,392	11,888	14,249
Rhode Island	25.1	28.2	551,600	134,126	4,113	14,213	975	14,577
South Carolina	18.8	25.4	1,752,900	611,629	2,866	38,153	3,377	11,298
South Dakota	21.5	25.1	372,000	125,458	2,965	8,364	708	11,814
Tennessee	16.8	21.2	2,079,301	818,073	2,542	57,645	4,803	12,002
Texas	20.4	26.9	11,648,726	3,209,515	3,629	224,877	16,685	13,478
Utah	24.2	23.8	1,088,471	415,994	2,617	18,288	1,665	10,984
Vermont	26.1	28.9	355,340	92,112	3,858	7,220	541	13,346
Virginia	21.0	24.4	3,659,143	975,135	3,752	89,169	5,787	15,409
Washington	25.8	25.8	2,948,364	761,428	3,872	66,978	4,462	15,011
West Virginia	23.3	29.6	1,102,050	351,837	3,132	20,289	1,918	10,578
Wisconsin	25.6	30.7	3,281,270	767,819	4,273	66,549	4,785	13,908
Wyoming	25.7	54.5	703,950	100,955	6,973	6,485	507	12,791

*The figures shown are for calendar year 1986.

SOURCES: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1988* (based on Common Core of Data surveys, various years), and unpublished data. National Education Association, *Estimates of School Statistics, 1986–87*, 1987, copyrighted. U.S. Department of Commerce, Bureau of Economic Analysis, *State Personal Income: 1929–82*, 1984, and Regional Economic Information System, August 1987.

Table 1:11-1. – Full-time-equivalent staff employed in public school systems: Selected school years ending 1960–1987

Type of staff	1960	1970	1981	1987
		(In thousands)		
Total	2,089	3,368	4,168	4,247
Classroom teachers[1]	1,353	2,023	2,184	2,243
Other staff[2]	736	1,344	1,984	2,004

[1] Includes a small number of teacher aides.

[2] Includes (a) instructional support staff, such as teacher aides, librarians, guidance counselors, principals, and assistant principals; (b) school district administrative staff, such as superintendents and their assistants, intermediate district staff, and supervisors of instruction; and (c) other support staff, such as clerical, transportation, food service, plant operation, and health staff.

NOTE: Detail may not add to totals due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Statistics of State School Systems*, various years; and special tabulations, 1987.

Table 1:11-2.—Full-time-equivalent staff employed in public school systems: School years ending 1983–1987

Type of staff	1983	1984	1985*	1986*	1987
	Number (in thousands)				
All	3,927	3,908	4,063	4,161	4,247
Classroom teachers	2,121	2,126	2,168	2,207	2,243
Instructional support[1]	396	387	399	421	449
Administrators and administrative support[2]	511	512	511	516	540
Other support[3]	899	883	984	1,016	1,015
	Percentage distribution				
All	100.0	100.0	100.0	100.0	100.0
Classroom teachers	54.0	54.4	53.4	53.0	52.8
Instructional support	10.1	9.9	9.8	10.1	10.6
Administrators and administrative support	13.0	13.1	12.6	12.4	12.7
Other support	22.9	22.6	24.2	24.4	23.9

*Data revised from previously published figures.

[1] Includes instructional aides, guidance counselors, and librarians.

[2] Includes school and district administrators and the associated clerical staff.

[3] Includes all employees not included above, such as media personnel, bus drivers, security officers, cafeteria workers, etc.

NOTE: Detail may not add to totals due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics: 1985–86, 1987*, and *1988* (based on Common Core of Data survey); and unpublished estimates. See also "Staff in Public Elementary Schools, Secondary Schools, and School Systems, Fall 1984," *OERI Bulletin*, January 1987; and "Staff in Public Elementary and Secondary Schools and School Systems, Fall 1983," *OERI Historical Report*, February 1987.

Indicator 1:12

Table 1:12-1.—Estimated average annual salary of teachers in public elementary and secondary schools: Selected school years ending 1960–1987

Year	Current dollars			Constant 1986–87 dollars*		
	All teachers	Elementary teachers	Secondary teachers	All teachers	Elementary teachers	Secondary teachers
1960	$ 4,995	$ 4,815	$ 5,276	$18,913	$18,231	$19,976
1962	5,515	5,340	5,775	20,404	19,757	21,366
1964	5,995	5,805	6,266	21,612	20,927	22,589
1966	6,485	6,279	6,761	22,593	21,875	23,554
1968	7,423	7,208	7,692	24,275	23,571	25,154
1970	8,635	8,412	8,891	25,434	24,777	26,188
1971	9,267	9,021	9,568	25,963	25,269	26,801
1972	9,705	9,424	10,031	26,238	25,478	27,119
1973	10,176	9,893	10,507	26,444	25,709	27,304
1974	10,778	10,507	11,077	25,708	25,062	26,421
1975	11,690	11,334	12,000	25,109	24,344	25,774
1976	12,600	12,280	12,937	25,270	24,628	25,946
1977	13,354	12,989	13,776	25,315	24,623	26,115
1978	14,298	13,845	14,603	25,219	24,592	25,939
1979	15,032	14,681	15,450	24,410	23,840	25,089
1980	15,970	15,569	16,459	22,886	22,311	23,587
1981	17,644	17,230	18,142	22,664	22,132	23,304
1932	19,274	18,853	19,805	22,782	22,284	23,410
1983	20,693	20,226	21,288	23,451	22,922	24,125
1984	21,917	21,456	22,554	23,955	23,451	24,651
1985	23,595	23,185	24,197	24,823	24,391	25,456
1986	25,206	24,667	25,842	25,769	25,218	26,419
1987	26,704	26,141	27,351	26,704	26,141	27,351

*Based on the Consumer Price Index, prepared by the Bureau of Labor Statistics, U.S. Department of Labor, and adjusted to a school-year basis.

NOTE: Data for some recent years have been revised from previously published figures.

SOURCE: National Education Association, *Estimates of School Statistics*, various years, copyrighted.

Table 1:13-1.—Pupil/teacher ratios, by size, control, and level

School level	Total	Number of students enrolled			
		Fewer than 100	100–299	300–499	500 or more
		Public school ratio, 1984–85			
All schools*	18.5	11.6	15.7	18.4	19.2
Elementary	19.3	—	17.5	19.2	20.0
Secondary	17.9	—	13.2	16.1	18.5
Combined	15.0	—	10.8	15.1	19.0
		Private school ratio, 1985–86			
All schools*	17.5	12.2	16.0	17.8	20.2
Elementary	20.0	13.4	18.2	21.3	26.1
Secondary	17.2	—	11.3	14.1	19.8
Combined	12.7	10.6	11.8	12.9	14.2

—Too few cases for a reliable estimate.

*Does not include special education, alternative, and vocational/technical schools. Elementary schools contain no grade higher than 8. Secondary schools contain no grade lower than 7. Combined schools contain all other grade spans, such as K-12 or ungraded.

NOTE: Pupil/teacher ratios are the number of pupils enrolled divided by the number of full-time-equivalent teachers.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1985–86 Private School Survey and 1985 Public School Survey, unpublished tabulations.

Table 1:13-2.—Trends in pupil/teacher ratios in public elementary and secondary schools: School years ending 1971–1988

Year	Pupil/teacher ratio	Year	Pupil/teacher ratio
1971	22.3	1980	19.1
1972	22.3	1981	18.8
1973	21.8	1982	18.9
1974	21.3	1983	18.7
1975	20.8	1984	18.5
1976	20.4	1985	18.1
1977	20.3	1986	17.9
1978	19.7	1987	[1]17.8
1979	19.3	1988	[2]17.7

[1] Preliminary.

[2] Early estimate.

NOTE: The basic data used to calculate the ratios in this table and in table 1:13-1 were collected by different surveys using different methodologies. Consequently, the estimated pupil/teacher ratio for 1984–85 in this table differs from the ratio in table 1:13-1.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Statistics of Public Elementary and Secondary Day Schools*, various years; and unpublished tabulations.

Table 1:13-3.—Trends in median class size in public elementary and secondary schools: Selected years, 1961–1986

Year	Elementary*	Secondary*
	Students per class	
1961	30	27
1966	29	27
1971	27	26
1976	26	25
1981	25	24
1986	24	22

*Elementary is defined as nondeparmentalized elementary, and secondary is defined as secondary and departmentalized elementary.

SOURCE: National Education Association, *Status of the American Public School Teacher 1985–86*, 1987, copyrighted.

Table 1:13-4.—Standard errors for pupil/teacher ratios, by size, control, and level (table 1:13-1)

School level	Total	Number of students enrolled: Fewer than 100	100–299	300–499	500 or more
			Public schools, 1984–85		
All schools*	0.10	0.60	0.26	0.20	0.12
Elementary	.14	—	.30	.23	.20
Secondary	.13	—	.38	.28	.14
Combined	.56	—	.53	.66	.78
			Private schools, 1985-86		
All schools*	0.46	0.70	0.61	0.62	0.92
Elementary	.55	.98	.60	1.28	.98
Secondary	.68	—	.57	.85	.91
Combined	.64	.93	1.13	.79	1.03

—Too few cases for a reliable estimate.

*Does not include special education, alternative, and vocational/technical schools. Elementary schools contain no grade higher than 8. Secondary schools contain no grade lower than 7. Combined schools contain all other grade spans, such as K-12 or ungraded.

NOTE: Pupil/teacher ratios are the number of pupils enrolled divided by the number of full-time-equivalent teachers.

SOURCE: U.S. Department of Education, Center for Education Statistics, 1985–86 Private School Survey and 1985 Public School Survey, unpublished tabulations.

Table 1:13-5.—Number of schools, by size, control, and level (table 1:13-1)

School level	Total	Number of students enrolled Fewer than 100	100–299	300–499	500 or more
			Public schools, 1984–85		
All schools*	78,786	5,587	18,729	25,199	29,271
Elementary	55,022	—	13,629	20,449	16,539
Secondary	19,337	—	3,314	3,333	11,907
Combined	4,427	—	1,786	1,417	825
			Private schools, 1985–86		
All schools*	22,689	6,194	10,058	3,741	2,696
Elementary	15,303	4,029	7,535	2,516	1,223
Secondary	2,437	—	650	603	958
Combined	4,949	1,939	1,873	622	515

—Too few cases for a reliable estimate.

*Does not include special education, alternative, and vocational/technical schools. Elementary schools contain no grade higher than 8. Secondary schools contain no grade lower than 7. Combined schools contain all other grade spans, such as K-12 or ungraded.

NOTE: Pupil/teacher ratios are the number of pupils enrolled divided by the number of full-time-equivalent teachers.

SOURCE: U.S. Department of Education, Center for Education Statistics, 1985–86 Private School Survey and 1985 Public School Survey, unpublished tabulations.

Indicator 1:13

Supplemental note 1:13.–Pupil/teacher ratios

Historically, pupil/teacher ratios are lower than average class size because the calculation of class size excludes teachers of classes that are not part of the regular instructional program. These excluded teachers, such as those in special education, those for the gifted and talented, and art, music, and physical education teachers, tend to have smaller classes than regular classroom teachers.

Table 1:14-1.—Projected annual demand for new hiring of classroom teachers in public elementary/ secondary schools: Fall 1988–1997

Year	Projected demand for new hiring of teachers		
	Total	Elementary	Secondary
1988	128,000	80,000	48,000
1989	140,000	87,000	53,000
1990	143,000	87,000	57,000
1991	149,000	85,000	64,000
1992	161,000	87,000	74,000
1993	166,000	88,000	78,000
1994	169,000	88,000	81,000
1995	174,000	88,000	86,000
1996	174,000	89,000	84,000
1997	171,000	89,000	83,000

NOTE: Projections are substantially revised from previously published figures due to changes in projection methodology.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Projections of Education Statistics to 1997–98,* forthcoming.

Supplemental note 1:14.–Demand for new hiring of public school teachers

In an April 1988 *Targeted Forecast* on public classroom teachers, the National Center for Education Statistics for the first time used econometric models to forecast numbers of public elementary and secondary school classroom teachers. That model was also used to produce the forecasts for this indicator. In that model, the number of public school teachers was forecast separately for the elementary and secondary levels. The number of elementary teachers was modeled as a function of per capita income (lagged 2 years), revenue receipts from State sources per capita, and elementary enrollment. The number of secondary teachers was modeled as a function of per capita income (lagged 1 year), revenue receipts from State sources per capita, and secondary enrollment (lagged 1 year). Both per capita income and revenue receipts from State sources were in constant 1982 dollars.

This model is based upon suggestions by the National Academy of Sciences report, *Toward Understanding Teacher Supply and Demand: Priorities for Research and Development Interim Report*. The equations used in the forecast model should be viewed as forecasting rather than structural equations, as the limitations of time and available data precluded the building of a large-scale structural teacher model. The particular equations used were selected on the basis of their statistical properties, such as coefficients of determination (R-squares), the t-statistics of the variables, the Durbin-Watson statistics, and residual plots.

The multiple regression technique used yields good results only if the relationships that existed among the variables in the past continue throughout the forecast period.

The projections presented in this indicator are substantially different from those published in earlier editions of *The Condition of Education*. This is primarily due to the adoption of the projection methodology described above. Previous projection models had relied very heavily on extrapolations of pupil/teacher ratios, which had been steadily declining for many years. The new projection model used in this indicator makes no explicit assumptions about pupil/teacher ratios. The projections presented in this indicator are therefore smaller, but more realistic, than earlier projections.

The turnover rates used in the model are calculated by the Bureau of Labor Statistics from the Current Population Survey (CPS) conducted by the Bureau of the Census. A matched sample was created by identifying persons who appeared in the monthly CPS sample in 2 consecutive years. Unfortunately, some individuals who were in the first sample and should have been in the sample a year later could not be identified. Individuals who die between surveys do not appear in both surveys and cannot be part of the CPS matched file. Thus the CPS matched data exclude occupational separations due to deaths. Since some employed individuals die and must be replaced, however, the replacement-needs data are biased downward to the extent that they exclude deaths. Depending on the occupation, excluding deaths probably understates replacement needs by 0.4–0.7 percent.

Individuals who changed their residence were a more significant problem. For any rotation group in the sample, CPS interviewers obtain information about individuals at a specific residence. Thus, individuals who move are not included in the sample a year later. Although merged data exclude persons who move, the merged data on changes in occupation and labor force status are quite close to the information for all persons combined. Apparently, the overstatement in movements resulting from response error is compensated for by excluding persons who moved.

CPS considers different teaching or administrative positions as separate occupations. For example, an elementary school teacher who becomes a secondary school teacher would be considered as a separation for the purposes of calculating the turnover rate. This would tend to overstate the turnover rate and lead to higher projections of demand for new hiring.

Individual States may have turnover rates (and definitions of turnover) that vary greatly from those obtained from the Bureau of Labor Statistics.*

The total number of public school teachers, enrollment by organizational level, and revenue receipts from State sources used in these forecasts were obtained from the Common Core of Data (CCD) survey conducted by the U.S. Department of Education, National Center for Education Statistics. The proportion of teachers by organizational level was obtained from the National Education Association and then applied to the total number of teachers from CCD to produce the number of teachers by organizational level. No comparable time series of this type exists for private schools; thus, forecasts of private school teachers could not be calculated. Disposable personal income and population were obtained from Data Resources, Inc.

For more information on these projections, see U.S. Department of Education, National Center for Education Statistics, *Projections of Education Statistics to 1997–98*, forthcoming.

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*U.S. Department of Labor, Bureau of Labor Statistics, *Occupational Projections and Training Data*, December 1982, p. 74.

Table 1:15-1.—High school principals who reported having difficulty hiring fully qualified teachers for vacancies, by school size, type of community, and subject: School year ending 1986

		Size of school*			Type of community		
Subject	Total	Small	Medium	Large	Rural	Urban	Suburban
	Percent of principals						
Physics	72	73	72	67	77	67	65
Chemistry	63	64	64	56	69	60	52
Computer science	62	65	62	47	70	59	48
Mathematics	57	61	52	47	67	52	40
Foreign language	52	55	60	31	57	46	49
Biology/life science	38	44	33	18	50	33	13
Physical science	38	43	30	28	48	26	24
Earth/space science	38	43	30	27	49	30	14
Special education	37	41	31	31	48	29	16
General science	27	35	11	15	38	16	10
Social studies	6	5	10	6	7	8	4

*Small = fewer than 800 students
Medium = 800–1,400 students
Large = more than 1,400 students

NOTE: Schools that indicated "No vacancies/does not apply" for a particular subject were not included in the analysis for that subject. High school is defined as any school containing at least one of grades 10 through 12.

SOURCE: Iris R. Weiss, *Report of the 1985–86 National Survey of Science and Mathematics Education*, Research Triangle Institute, 1987; and personal communication with the author.

Table 1:15-2.—Number of high school principals (and standard errors) who reported having difficulty hiring fully qualified teachers for vacancies, by school size, type of community, and subject: School year ending 1986 (table 1:15-1)

Subject	Total	Size of school*			Type of community		
		Small	Medium	Large	Rural	Urban	Suburban
	Number of principals (standard errors)						
Physics	232 (4.6)	78 (7.9)	70 (8.4)	84 (8.1)	80 (7.4)	70 (8.8)	82 (8.3)
Chemistry	237 (4.9)	78 (8.5)	76 (8.7)	83 (8.6)	80 (8.1)	69 (9.3)	88 (8.4)
Computer science	223 (5.1)	78 (8.5)	66 (9.4)	79 (8.8)	71 (8.6)	69 (9.3)	83 (8.6)
Mathematics	269 (4.7)	92 (8.0)	81 (8.7)	96 (8.0)	92 (7.7)	76 (9.0)	101 (7.7)
Foreign language	247 (5.0)	86 (8.4)	74 (9.0)	87 (7.8)	81 (8.6)	70 (9.4)	96 (8.0)
Biology/life science	237 (4.9)	79 (8.8)	74 (8.6)	84 (6.6)	79 (8.8)	69 (8.9)	89 (5.6)
Physical science	200 (5.4)	59 (10.2)	61 (9.2)	80 (7.9)	65 (9.8)	65 (8.6)	70 (8.0)
Earth/space science	170 (5.8)	57 (10.3)	45 (10.8)	68 (8.5)	58 (10.3)	51 (10.1)	61 (7.0)
Special education	225 (5.0)	73 (9.1)	70 (8.7)	82 (8.0)	84 (8.6)	58 (9.4)	83 (6.3)
General science	170 (5.3)	57 (10.0)	47 (7.2)	66 (6.9)	53 (10.5)	53 (7.9)	69 (5.7)
Social studies	172 (2.8)	75 (4.0)	70 (5.6)	82 (4.1)	75 (4.6)	64 (5.3)	88 (3.3)

*Small = fewer than 800 students
Medium = 800–1,400 students
Large = more than 1,400 students

NOTE: Schools that indicated "No vacancies/does not apply" for a particular subject were not included in the analysis for that subject. High school is defined as any school containing at least one of grades 10 through 12.

SOURCE: Iris R. Weiss, *Report of the 1985–86 National Survey of Science and Mathematics Education*, Research Triangle Institute, 1987, and personal communication with the author.

Table 1:16-1.—Public and private school enrollment, kindergarten through grade 12 (K–12): 1970–1986

Fall of year	Public school			Private school			Private school enrollment as a percentage of total enrollment		
	Total K–12	K–8	9–12	Total K–12	K–8	9–12	Total K–12	K–8	9–12
	Enrollment (in thousands)						Percent		
1970	46,193	32,648	13,545	5,655	4,485	1,170	10.9	12.1	8.0
1971	46,575	32,518	14,057	5,378	4,252	1,126	10.4	11.6	7.4
1972	45,344	31,329	14,015	5,203	4,048	1,155	10.3	11.4	7.6
1973	44,945	30,783	14,162	4,945	3,761	1,184	9.9	10.9	7.7
1974	44,957	30,682	14,275	4,867	3,695	1,172	9.8	10.7	7.6
1975	44,520	30,017	14,503	5,001	3,821	1,180	10.1	11.3	7.5
1976	44,201	29,660	14,541	4,804	3,603	1,201	9.8	10.8	7.6
1977	43,153	28,648	14,505	5,025	3,777	1,248	10.4	11.6	7.9
1978	41,976	27,745	14,231	4,978	3,734	1,244	10.6	11.9	8.0
1979	41,343	27,349	13,994	4,663	3,541	1,122	10.1	11.5	7.4
1980	—	27,088	—	—	3,537	—	—	11.5	—
1981	40,897	27,374	13,523	4,701	3,582	1,119	10.3	11.6	7.6
1982	40,131	27,127	13,004	4,702	3,584	1,118	10.5	11.7	7.9
1983	39,701	26,909	12,792	4,868	3,650	1,218	10.9	11.9	8.7
1984*	39,794	27,073	12,721	4,306	3,249	1,057	9.8	10.7	7.7
1985	39,788	27,024	12,764	4,872	3,657	1,215	10.9	11.9	8.7
1986	40,237	27,491	12,746	4,757	3,591	1,166	10.6	11.6	8.4

— Not available.

* An unexplained drop occurred in the number and proportion of private school students in 1984, according to the Bureau of the Census. However, the 1984 data appear to be an anomaly, since the 1985 and 1986 figures for private school students are very similar to those for 1983 and are consistent with the trend from 1979 to 1983.

NOTE: Detail may not add to totals due to rounding.

SOURCE: U.S. Department of Commerce, Bureau of the Census, "School Enrollment—Social and Economic Characteristics of Students: October 1984 (Advance Report)" and "October 1985 (Advance Report)," *Current Population Reports*, Series P-20, Nos. 404 and 409; and personal communication with the author.

Table 1:16-2.—Standard errors for public and private school K-12 enrollment: 1970–1986 (table 1:16-1)

Year (fall)	Public school			Private school			Private school enrollment as a percentage of total enrollment		
	Total K–12	K–8	9–12	Total K–12	K–8	9–12	Total K–12	K–8	9–12
	Standard errors (in thousands)						Standard errors of percentages		
1970	240	95	151	104	96	48	0.2	0.3	0.3
1971	241	96	153	102	94	47	.2	.3	.3
1972	239	106	153	100	92	48	.2	.3	.3
1973	239	110	154	98	89	48	.2	.3	.3
1974	239	111	154	97	88	48	.2	.3	.3
1975	238	115	155	98	90	48	.2	.3	.3
1976	238	117	155	96	86	49	.2	.3	.3
1977	237	123	155	98	89	50	.2	.3	.3
1978	235	127	154	98	89	50	.2	.3	.3
1979	234	129	153	95	87	47	.2	.3	.3
1980	—	130	—	—	87	—	—	.3	—
1981	251	138	162	102	93	52	.2	.3	.3
1982	249	140	164	102	93	51	.2	.3	.3
1983	249	141	164	104	94	51	.2	.3	.4
1984	249	140	165	98	89	52	.2	.3	.3
1985	249	140	165	104	94	52	.2	.3	.4
1986	250	138	158	103	94	52	.2	.3	.4

—Not available.

SOURCE: U.S. Department of Commerce, Bureau of the Census, "School Enrollment—Social and Economic Characteristics of Students: October 1984 (Advance Report)" and "October 1985 (Advance Report)," *Current Population Reports*, Series P-20, Nos. 404 and 409; and personal communication with the author.

Table 1:17-1.—Public school enrollment, kindergarten through grade 8 (K–8) and grades 9–12, with projections: 1969–1997

(In thousands)

Fall of year	Grades K–12*	Grades K–8*	Grades 9–12
1969	45,619	32,597	13,022
1970	45,909	32,577	13,332
1971	46,081	32,265	13,816
1972	45,744	31,831	13,913
1973	45,429	31,353	14,077
1974	45,053	30,921	14,132
1975	44,791	30,487	14,304
1976	44,317	30,006	14,311
1977	43,577	29,336	14,240
1978	42,550	28,328	14,223
1979	41,645	27,931	13,714
1980	40,987	27,674	13,313
1981	40,099	27,245	12,855
1982	39,652	27,156	12,496
1983	39,352	26,997	12,355
1984	39,295	26,918	12,377
1985	39,509	27,049	12,460
1986	39,837	27,404	12,434
1987	40,200	27,983	12,217
		Projected	
1988	40,200	28,439	11,841
1989	40,337	28,807	11,530
1990	40,752	29,366	11,386
1991	41,306	29,794	11,512
1992	41,879	30,178	11,701
1993	42,444	30,460	11,984
1994	43,014	30,624	12,390
1995	43,442	30,738	12,704
1996	43,775	30,772	13,003
1997	43,960	30,754	13,206

*Includes most kindergarten and some prekindergarten enrollment.

NOTE: Detail may not add to totals due to rounding. Some data revised from previously published figures.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Projections of Education Statistics to 1997-98*, forthcoming.

Supplemental note 1:17.-Trends in public school enrollment: 1969-1997

The National Center for Education Statistics (NCES) projected enrollment in public elementary and secondary grades 2 through 12 using a grade retention method. This method starts with 6-year-olds entering first grade and then follows their subsequent progress through public elementary and secondary schools. The method assumes that past trends in factors affecting enrollments will continue over the projection period. The method also implicitly includes the net effect of such variables as immigration, dropouts, transfers to and from private schools, and deaths. NCES projected enrollment for kindergarten, first grade, elementary ungraded and special, secondary ungraded and special, and postgraduate schools using enrollment rates for populations of 5-, 6-, 5-13-, 14-17-, and 18-year-olds as the bases. Both public grade retention rates and public enrollment rates by age are projected to remain constant at levels consistent with most recent rates.

These enrollment forecasts are demographically based. NCES chose to use Bureau of the Census middle series (series 14) population projections. These assume an ultimate completed cohort fertility rate of 1.8 births per woman by the year 2050 and a net annual immigration of 600,000 through 1988. Net immigration then decreases 10,000 every year to 500,000 by 1998 and remains constant thereafter.

For further details on the methods used to develop these forecasts, see *Projections of Education Statistics to 1997-98*, forthcoming.

The Center used mean absolute percentage error (MAPE) to measure forecast accuracy. An analysis of projection errors (differences between actual and projected numbers) from the past fourteen editions of *Projections of Education Statistics* indicates that MAPEs for total enrollment in public elementary and secondary schools were 0.2 percent for 1 year ahead, 0.4 percent for 2 years ahead, and 0.8 percent for 5 years ahead. For projections of public enrollment in grades K through 8, the MAPEs were 0.3 for 1 year ahead, 0.6 for 2 years ahead, and 0.9 percent for 5 years ahead; in grades 9 through 12 they were 0.6, 0.8, and 2.0 percent, respectively.

Table 1:18-1.—Elementary and secondary students served in federally supported education programs for the handicapped, by type of handicap: School years ending 1979–1987

Type of handicap	1979	1980	1981	1982	1983	1984	1985	1986	1987
	Number served (in thousands)								
All conditions	3,889	4,005	4,142	4,198	4,255	4,298	4,315	4,317	4,374
Learning disabled	1,130	1,276	1,462	1,622	1,741	1,806	1832	1,862	1,914
Speech impaired	1,214	1,186	1,168	1,135	1,131	1,128	1126	1,125	1,136
Mentally retarded	901	869	829	786	757	727	694	660	643
Seriously emotionally disturbed	300	329	346	339	352	361	372	375	383
Hard of hearing and deaf	85	80	79	75	73	72	69	66	65
Orthopedically handicapped	70	66	58	58	57	56	56	57	57
Other health impaired	105	106	98	79	50	53	68	57	52
Visually handicapped	32	31	31	29	28	29	28	27	26
Multihandicapped	50	60	68	71	63	65	69	86	97
Deaf-blind	2	2	3	2	2	2	2	2	2
	Percentage distribution of children served								
All conditions	99.2	100.0	99.2	100.0	99.4	100.0	99.3	99.3	99.4
Learning disabled	29.1	31.9	35.3	38.6	40.9	42.0	42.4	43.1	43.8
Speech impaired	31.2	29.6	28.2	27.0	26.6	26.2	26.1	26.1	26.0
Mentally retarded	23.2	21.7	20.0	18.7	17.8	16.9	16.1	15.3	14.7
Seriously emotionally disturbed	7.7	8.2	8.4	8.1	8.3	8.4	8.6	8.7	8.8
Hard of hearing and deaf	2.2	2.0	1.9	1.8	1.7	1.7	1.6	1.5	1.5
Orthopedically handicapped	1.8	1.6	1.4	1.4	1.3	1.3	1.3	1.3	1.3
Other health impaired	2.7	2.6	2.4	1.9	1.2	1.2	1.6	1.3	1.2
Visually handicapped	.8	.8	.8	.7	.7	.7	.7	.6	.6
Multihandicapped	1.3	1.5	1.6	1.7	1.5	1.5	1.6	2.0	2.2
Deaf-blind	.1	(1)	.1	(1)	(1)	.1	(1)	(1)	(1)

Table 1:18-1.–Elementary and secondary students served in federally supported education programs for the handicapped, by type of handicap: School years ending 1979-1987–Continued

Type of handicap	1979	1980	1981	1982	1983	1984	1985	1986	1987
	Number served as a percent of total enrollment[2]								
All conditions	9.14	9.62	10.11	10.46	10.73	10.92	10.98	10.93	10.97
Learning disabled	2.66	3.06	3.57	4.04	4.39	4.59	4.66	4.71	4.80
Speech impaired	2.85	2.85	2.86	2.83	2.85	2.87	2.87	2.85	2.85
Mentally retarded	2.12	2.09	2.02	1.96	1.91	1.85	1.77	1.67	1.61
Seriously emotionally disturbed	.71	.79	.85	.85	.89	.92	.95	.95	.96
Hard of hearing and deaf	.20	.19	.19	.19	.18	.18	.17	.17	.16
Orthopedically handicapped	.16	.16	.14	.14	.14	.14	.14	.14	.14
Other health impaired	.25	.25	.24	.20	.13	.13	.17	.14	.13
Visually handicapped	.08	.08	.08	.07	.07	.07	.07	.07	.07
Multihandicapped	.12	.14	.17	.16	.16	.17	.17	.22	.24
Deaf-blind	.01	.01	.01	([3])	.01	.01	([3])	.01	([3])

[1] Less than 0.05.

[2] Based on enrollment in public schools, kindergarten through 12th grade.

[3] Less than 0.005.

NOTE: Counts are based on reports from the 50 States and the District of Columbia only (i.e., figures from U.S. territories are not included). Counts are from two Federal programs: the Education of the Handicapped program (3- to 21-year-olds) and Chapter 1 of the Education Consolidation and Improvement Act–State-Operated Programs (0- to 20-year-olds). Detail may not add to totals due to rounding.

SOURCE: U.S. Department of Education, Office of Special Education and Rehabilitative Services, *Annual Report to Congress on the Implementation of the Education of the Handicapped Act*, various years. National Center for Education Statistics, Common Core of Data survey; and unpublished data.

Indicator 1:18

Table 1:18-2.—Total enrollment and special education enrollment in public elementary and secondary schools, by State: School years ending 1986 and 1987

State	Total enrollment				Special education enrollment			
	1986[1]	1987	Difference, 1986–87	Percent change, 1986–87	1986	1987	Difference, 1986–87	Percent change, 1986–87
United States	39,508,625	39,837,459	328,834	0.83	4,316,692	4,373,638	56,946	1.32
Alabama	730,460	733,735	3,275	0.45	91,107	91,231	124	.14
Alaska[2],[5]	107,345	107,973	628	0.59	11,895	12,211	316	2.66
Arizona[3]	548,252	534,538	−13,714	−2.50	51,805	53,219	1,414	2.73
Arkansas[2]	433,410	437,438	4,028	0.93	47,322	48,222	900	1.90
California[2]	4,255,554	4,377,989	122,435	2.88	378,888	391,217	12,329	3.25
Colorado[2]	550,642	558,415	7,773	1.41	47,953	49,515	1,562	3.26
Connecticut[6]	462,026	468,847	6,821	1.48	65,426	64,758	−668	−1.02
Delaware	92,901	94,410	1,509	1.62	15,322	15,275	−47	−.31
District of Columbia[3]	87,092	85,612	−1,480	−1.70	7,069	7,114	45	.64
Florida[2]	1,562,283	1,607,320	45,037	2.88	172,821	181,651	8,830	5.11
Georgia	1,079,594	1,096,425	16,831	1.56	93,295	93,229	−66	−.07
Hawaii	164,169	164,640	471	0.29	11,947	11,658	−289	−2.42
Idaho	208,669	208,391	−278	−0.13	19,159	18,640	−519	−2.71
Illinois[4]	1,826,478	1,825,185	−1,293	−0.07	242,333	248,169	5,836	2.41
Indiana[4]	966,106	966,780	674	0.07	104,417	105,978	1,561	1.49
Iowa	485,332	481,286	−4,046	−0.83	56,476	56,205	−271	−.48
Kansas[2]	410,229	416,091	5,862	1.43	41,176	42,373	1,197	2.91
Kentucky	643,833	642,778	−1,055	−0.16	73,560	73,711	151	.21
Louisiana	788,349	795,188	6,839	0.87	76,628	73,852	−2,776	−3.62
Maine	206,101	211,752	5,651	2.74	27,845	26,841	−1,004	−3.61
Maryland[2]	671,560	675,747	4,187	0.62	89,041	90,294	1,253	1.41
Massachusetts[3]	844,330	833,918	−10,412	−1.23	141,448	143,636	2,188	1.55
Michigan	1,689,828	1,681,880	−7,948	−0.47	161,862	161,446	−416	−.26
Minnesota[2]	705,140	711,134	5,994	0.85	81,488	82,407	919	1.13
Mississippi	471,195	498,639	27,444	5.82	53,084	55,683	2,599	4.90
Missouri	795,107	800,606	5,499	0.69	99,378	99,692	314	.32
Montana	153,869	153,327	−542	−0.35	15,376	15,369	−7	−.05
Nebraska	265,819	267,139	1,320	0.50	30,453	30,171	−282	−.93
Nevada	154,948	161,239	6,291	4.06	14,178	14,743	565	3.99
New Hampshire	160,974	163,717	2,743	1.70	16,071	16,323	252	1.57

Table 1:18-2.—Total enrollment and special education enrollment in public elementary and secondary schools, by State: School years ending 1986 and 1987—Continued

State	Total enrollment				Special education enrollment			
	1986[1]	1987	Difference, 1986–87	Percent change, 1986–87	1986	1987	Difference, 1986–87	Percent change, 1986–87
New Jersey[3]	1,116,194	1,107,467	−8,727	−0.78	170,512	172,018	1,506	.88
New Mexico	277,551	281,943	4,392	1.58	29,556	29,816	260	.88
New York[3]	2,621,378	2,607,719	−13,659	−0.52	289,583	292,981	3,398	1.17
North Carolina	1,086,165	1,085,248	−917	−0.08	112,934	109,214	−3,720	−3.29
North Dakota[4]	118,570	118,703	133	0.11	11,850	12,279	429	3.62
Ohio	1,793,965	1,793,508	−457	−0.03	198,956	199,211	255	.13
Oklahoma	592,327	593,183	856	0.14	65,081	65,285	204	.31
Oregon[4]	447,527	449,307	1,780	0.40	46,575	47,487	912	1.96
Pennsylvania[3]	1,683,221	1,674,161	−9,060	−0.54	202,357	203,258	901	.45
Rhode Island[2]	133,442	134,126	684	0.51	19,152	19,527	375	1.96
South Carolina[2]	606,643	611,629	4,986	0.82	72,157	73,299	1,142	1.58
South Dakota[2]	124,291	125,458	1,167	0.94	13,629	14,034	405	2.97
Tennessee[2]	813,753	818,073	4,320	0.53	95,380	96,433	1,053	1.10
Texas	3,131,705	3,209,515	77,810	2.48	293,418	301,222	7,804	2.66
Utah	403,395	415,994	12,599	3.12	41,791	42,811	1,020	2.44
Vermont[2]	90,157	92,112	1,955	2.17	10,665	11,405	740	6.94
Virginia	968,104	975,135	7,031	0.73	102,814	103,727	913	.89
Washington[2]	749,706	761,428	11,722	1.56	68,451	70,282	1,831	2.67
West Virginia[3]	357,923	351,837	−6,086	−1.70	46,409	47,556	1,147	2.47
Wisconsin	768,234	767,819	−415	−0.05	75,945	76,067	122	.16
Wyoming[3]	102,779	100,955	−1,824	−1.77	10,654	10,893	239	2.24

[1] Data have been revised from previously published figures.

[2] The number of students enrolled in special education programs rose at a higher rate than the total public school enrollment.

[3] The number of special education students rose while total public school enrollment fell.

[4] The number of special education students rose while the total public school enrollment remained relatively the same (rose or decreased less than 0.5 percent).

[5] Data include students enrolled in public schools on Federal bases and other special arrangements.

[6] Beginning in school year 1986–87, data include State vocational/technical schools.

NOTE.—Some data have been revised slightly from previously published figures.

SOURCE: U.S. Department of Education, Center for Education Statistics, Common Core of Data survey; Office of Special Education and Rehabilitative Services, *Ninth Annual Report to Congress on the Implementation of the Education of the Handicapped Act, 1987;* and unpublished data.

Indicator 1:19

Table 1:19-1.—Total number of teachers and teacher evaluation of the change in disruptive behavior, by school characteristics: School year ending 1987

School characteristic	Total teachers (in thousands)[1]	Percent of teachers indicating that, compared to 5 years ago, disruptive student behavior is				
		Much less now	Somewhat less now	About the same	Somewhat more now	Much more now
All teachers	1,932	10	17	28	25	19
School level[2]						
Elementary	941	8	12	27	29	24
Middle-junior high	310	13	22	24	22	20
Senior high	647	12	23	32	22	12
School size						
Fewer than 400	465	11	16	28	25	21
400 to 999	985	10	17	28	26	19
1,000 or more	482	10	19	30	24	17
Metropolitan status						
Urban (within SMSA, central city)	405	15	16	20	23	26
Suburban (within SMSA, outside central city)	888	8	16	32	26	18
Rural (outside SMSA)	640	11	19	28	26	16

[1] Includes regular classroom teachers only; excludes librarians, special education teachers, and guidance counselors.

[2] Elementary schools—lowest grade is less than 6 and the highest grade is less than 9; Middle-junior high schools—lowest grade is greater than 5 and the highest grade is less than 10; Senior high schools—lowest grade is greater than 6 and the highest grade is greater than 9; Combined schools—lowest grade is less than 6 and the highest grade is greater than 9. Combined schools are not listed as a separate school level because their number is so small; they are included in the totals and in analyses with other school characteristics. About 34,000 teachers taught in combined schools.

NOTE: Detail may not add to totals due to rounding.

SOURCE: U.S. Department of Education, Center for Education Statistics, "Public School Teacher Perspectives on School Discipline," *OERI Bulletin*, October 1987.

Table 1:19-2.—Percent of public school teachers indicating extent to which student behavior interferes with their teaching, by school level and metropolitan status: School year ending 1987

		School level*			Metropolitan status		
Extent	Total	Elementary	Middle-junior high	Senior high	Urban	Suburban	Rural
To a great extent	14	16	14	11	24	14	8
To a moderate extent	26	26	26	24	20	27	27
To a small extent	50	48	52	50	47	49	52
Not at all	11	9	8	15	8	11	13

* Elementary schools—lowest grade is less than 6 and the highest grade is less than 9; Middle-junior high schools—lowest grade is greater than 5 and the highest grade is less than 10; Senior high schools—lowest grade is greater than 6 and the highest grade is greater than 9; Combined schools—lowest grade is less than 6 and the highest grade is greater than 9. Combined schools are not listed as a separate school level because their number is so small; they are included in the totals and in analyses with other school characteristics. About 34,000 teachers taught in combined schools.

NOTE: Percents may not add to 100 due to rounding.

SOURCE: U.S. Department of Education, Center for Education Statistics, "Public School Teacher Perspectives on School Discipline," *OERI Bulletin*, October 1987.

Table 1:19-3.—Public school teachers' evaluation of the discipline policy of their schools, by school characteristics: School year ending 1987

School characteristic	Percent of teachers indicating that the discipline policy of their school was: In writing	Strict enough	Comprehensive enough	Clear	Consistently applied	Publicized enough
All teachers	93	66	72	80	50	60
School level*						
Elementary	91	69	69	78	55	59
Middle-junior high	96	65	76	83	45	60
Senior high	96	61	72	82	45	59
School size						
Less than 400	89	65	71	77	54	58
400 to 900	95	70	73	83	54	62
1,000 or more	94	58	70	78	40	56
Metropolitan status						
Urban (within SMSA, central city)	91	65	69	79	48	57
Suburban (within SMSA, outside central city)	93	65	72	80	51	62
Rural (outside SMSA)	95	69	73	82	50	58

* Elementary schools—lowest grade is less than 6 and the highest grade is less than 9;
Middle-junior high schools—lowest grade is greater than 5 and the highest grade is less than 10;
Senior high schools—lowest grade is greater than 6 and the highest grade is greater than 9;
Combined schools—lowest grade is less than 6 and the highest grade is greater than 9. Combined schools are not listed as a separate school level because their number is so small; they are included in the totals and in analyses with other school characteristics. About 34,000 teachers taught in combined schools.

SOURCE: U.S. Department of Education, Center for Education Statistics, "Public School Teacher Perspectives on School Discipline," *OERI Bulletin*, October 1987.

Table 1:19-4.—Teachers' evaluation of the extent to which student misbehavior interferes with their teaching: 1980–1982

Extent	1980	1981	1982
		Percent	
To a great extent	9	10	10
To a moderate extent	38	38	43
To a small extent	33	29	30
Not at all	21	23	17

SOURCE: U.S. Department of Education, Center for Education Statistics, "Public School Teacher Perspectives on School Discipline," *OERI Bulletin*, October 1987.

Table 1:19-5.—Standard errors for total number of teachers and teacher evaluation of the change in disruptive behavior, by school characteristics: School year ending 1987 (table 1:19-1)

School characteristic	Percent of teachers indicating that, compared to 5 years ago, disruptive student behavior is				
	Much less now	Somewhat less now	About the same	Somewhat more now	Much more now
All teachers	0.95	0.69	0.97	1.23	0.79
School level*					
Elementary	.99	.87	1.74	1.89	1.52
Middle-junior high	1.87	1.82	1.82	2.55	1.28
Senior high	1.44	1.43	1.54	1.85	1.20
Metropolitan status					
Urban (within SMSA, central city)	2.33	1.84	2.14	2.25	2.26
Suburban (within SMSA, outside central city)	1.23	1.22	1.48	2.03	1.26
Rural (outside SMSA)	1.15	1.18	1.67	1.57	1.55

* Elementary schools—lowest grade is less than 6 and the highest grade is less than 9; Middle-junior high schools—lowest grade is greater than 5 and the highest grade is less than 10; Senior high schools—lowest grade is greater than 6 and the highest grade is greater than 9; Combined schools—lowest grade is less than 6 and the highest grade is greater than 9. Combined schools are not listed as a separate school level because their number is so small; they are included in the totals and in analyses with other school characteristics. About 34,000 teachers taught in combined schools.

SOURCE: U.S. Department of Education, Center for Education Statistics, "Public School Teacher Perspectives on School Discipline," *OERI Bulletin*, October 1987.

Table 1:19-6.—Standard errors for percent of public school teachers indicating extent to which student behavior interferes with their teaching, by school level and metropolitan status: School year ending 1987 (table 1:19-2)

Extent	Total	School level*			Metropolitan status		
		Elementary	Middle-junior high	Senior high	Urban	Suburban	Rural
To a great extent	0.71	1.39	1.28	1.11	1.04	1.18	0.83
To a moderate extent	1.13	2.10	1.60	1.41	2.60	1.64	1.49
To a small extent	.87	1.93	1.73	1.50	2.92	1.39	1.62
Not at all	.56	.76	.76	.90	1.43	.97	1.22

* Elementary schools—lowest grade is less than 6 and the highest grade is less than 9; Middle-junior high schools—lowest grade is greater than 5 and the highest grade is less than 10; Senior high schools—lowest grade is greater than 6 and the highest grade is greater than 9; Combined schools—lowest grade is less than 6 and the highest grade is greater than 9. Combined schools are not listed as a separate school level because their number is so small; they are included in the totals and in analyses with other school characteristics. About 34,000 teachers taught in combined schools.

SOURCE: U.S. Department of Education, Center for Education Statistics, "Public School Teacher Perspectives on School Discipline," *OERI Bulletin*, October 1987.

Table 1:19-7.—Standard errors for public school teachers' evaluation of the discipline policy of their schools, by school level and metropolitan status: School year ending 1987 (table 1:19-3)

Policy	Total	School level*			Metropolitan status		
		Elementary	Middle-junior high	Senior high	Urban	Suburban	Rural
In writing	0.68	1.13	0.90	0.73	2.29	0.86	1.11
Strict enough	.94	1.26	2.09	1.90	3.10	1.26	1.85
Comprehensive enough	1.16	1.80	1.85	1.85	2.39	1.20	1.74
Clear	1.31	1.70	1.86	1.86	2.98	1.57	1.46
Consistently applied	1.04	1.57	2.28	2.10	3.21	1.75	1.56
Publicized enough	.88	1.86	1.76	1.95	3.12	1.49	1.35

* Elementary schools—lowest grade is less than 6 and the highest grade is less than 9; Middle-junior high schools—lowest grade is greater than 5 and the highest grade is less than 10; Senior high schools—lowest grade is greater than 6 and the highest grade is greater than 9; Combined schools—lowest grade is less than 6 and the highest grade is greater than 9. Combined schools are not listed as a separate school level because their number is so small; they are included in the totals and in analyses with other school characteristics. About 34,000 teachers taught in combined schools.

SOURCE: U.S. Department of Education, Center for Education Statistics, "Public School Teacher Perspectives on School Discipline," *OERI Bulletin*, October 1987.

Supplemental note 1:19.–Disruptive behavior in the public schools

The NEA results were based on a two-stage probability sample of about 2,000 teachers randomly selected from lists of teachers provided by school districts. Response rates for the years included in this report ranged from 75 to 80 percent. The standard errors for the population estimates were reported to be less than 3 percent of the estimates. Differences of 5 percent or more between percentages were reported significant at the 95 percent level. Some differences between the NEA results and FRSS results may be partially due to survey procedures. National Education Association, "Nationwide Teacher Opinion Poll, 1980," Bernard Bartholomew, Washington, D.C., p.3.

Table 1:20-1.—Trends in the use of drugs and alcohol by high school seniors: Selected years, 1975–1987

Substance used	Class of 1975	1977	1979	1981	1983	1985	1986	1987
				Number				
Total	9,400	17,100	15,500	17,500	16,300	16,000	15,200	16,300
				Percent ever used				
All illegal drugs*	55.2	61.6	65.1	65.6	62.9	60.6	57.6	56.6
Cocaine	9.0	10.8	15.4	16.5	16.2	17.3	16.9	15.2
Alcohol	90.4	92.5	93.0	92.6	92.6	92.2	91.3	92.2
				Percent who used in the last 12 months				
All illegal drugs*	45.0	51.1	54.2	52.1	47.4	46.3	44.3	41.7
Cocaine	5.6	7.2	12.0	12.4	11.4	13.1	12.7	10.3
Alcohol	84.8	87.0	88.1	87.0	87.3	85.6	84.5	85.7
				Percent who used in the last 30 days				
All illegal drugs*	30.7	37.6	38.9	36.9	30.5	29.7	27.1	24.7
Cocaine	1.9	2.9	5.7	5.8	4.9	6.7	6.2	4.3
Alcohol	68.2	71.2	71.8	70.7	69.4	65.9	65.3	66.4

* Includes marijuana, hallucinogens, cocaine, and heroin, other opiates, stimulants, sedatives, or tranquilizers not under a doctor's orders. About 75 percent of these users reported smoking marijuana.

SOURCE: U.S. Department of Health and Human Services, Alcohol, Drug Abuse and Mental Health Administration, National Institute on Drug Abuse, *Drug Use Among American High School Students, College Students, and Other Young Adults*, 1986, and personal communication with the author. See also U.S. Department of Education, *Schools Without Drugs*, 1986.

Table 1:20-2.—Confidence intervals (95 percent level) for percent of high school seniors using drugs and alcohol (table 1:20-1)

Observed percent*		Number of cases		
		10,000	15,000	20,000
95	+	0.7	0.6	0.6
	−	.8	.7	.7
90	+	.9	.9	.8
	−	1.0	.9	.9
85	+	1.1	1.0	1.0
	−	1.2	1.1	1.1
80	+	1.3	1.2	1.1
	−	1.3	1.2	1.2
70	+	1.5	1.4	1.3
	−	1.5	1.4	1.3
50	+	1.8	1.5	1.4
	−	1.8	1.5	1.4
30	+	1.5	1.4	1.3
	−	1.5	1.4	1.3
20	+	1.3	1.2	1.2
	−	1.3	1.2	1.1
15	+	1.2	1.1	1.1
	−	1.1	1.0	1.0
10	+	1.0	.9	.9
	−	.9	.9	.8
5	+	.8	.7	.7
	−	.7	.6	.6
3	+	.6	.6	.5
	−	.5	.5	.5
1	+	.4	.3	.3
	−	.3	.3	.2

* The table entries, when added to and subtracted from the observed percent, establish the 95 percent confidence interval (calculated as 1.96 sampling errors).

SOURCE: Johnston, L.D., Bachman, J.G., and O'Malley, P.M., *Monitoring the Future*, Institute for Social Research, University of Michigan, Ann Arbor, Michigan, 1984.

Table 1:21-1.—Actual and adjusted average reading proficiency scale scores, by average rating on school problems for 4th, 8th, and 11th graders: 1984

Grade and average rating on school problems[1]	Average reading scale score	
	Actual	Adjusted[2]
Grade 4		
Not a problem	229.6	223.0
Minor problem	209.5	213.5
Moderate problem	189.4	204.0
Grade 8		
Not a problem	271.9	266.1
Minor problem	257.5	259.1
Moderate problem	243.1	252.0
Grade 11		
Not a problem	306.3	296.7
Minor problem	289.4	289.1
Moderate problem	272.4	281.6

[1] School problems were rated by the principal as not a problem, minor, moderate, or serious problems. The problems included in this analysis include student absenteeism, lack of parent interest, lack of discipline, lack of teacher commitment/motivation, teacher absenteeism, teacher turnover, low standards for students, and vandalism.

[2] Scores adjusted for race/ethnicity, language spoken in the home, parental education, and number of reading aids in the home.

SOURCE: U.S. Department of Education, National Center for Education Statistics, "School Problems and Reading Performance," *Survey Report*, forthcoming.

Table 1:21-2.—Average rating of school problems, by grade and control of school: 1984

Grade and control of school	Average rating of school problems*		
	Not a problem	Minor	Moderate
	Percent of schools		
4th grade	56.4	42.3	1.3
Public	53.9	44.4	1.7
Private	66.1	34.0	.0
8th grade	53.3	44.4	2.3
Public	46.9	49.9	3.2
Private	67.6	32.1	.3
11th grade	11.9	73.9	14.2
Public	9.1	73.4	17.5
Private	22.6	76.0	1.4

* School problems were rated by the principal as not a problem, minor, moderate, or serious problems. The problems included in this analysis include student absenteeism, lack of parent interest, lack of discipline, lack of teacher commitment/motivation, teacher absenteeism, teacher turnover, low standards for students, and vandalism.

SOURCE: U.S. Department of Education, National Center for Education Statistics, "School Problems and Reading Performance," *Survey Report*, forthcoming.

Table 1:21-3.—Sample sizes and standard errors for average rating of school problems, by grade and control of school: 1984 (table 1:21-2)

		Average rating of school problems		
Grade and control of school	Sample size (number)	Not a problem	Minor	Moderate
			Standard error	
4th grade	600	2.0	2.0	0.5
Public	478	2.3	2.3	.6
Private	120	4.3	4.3	.0
8th grade	437	2.4	2.4	.7
Public	303	2.9	2.9	1.0
Private	133	4.1	4.1	.5
11th grade	293	1.9	2.6	2.0
Public	246	1.8	2.8	2.4
Private	47	6.1	6.2	1.7

SOURCE: U.S. Department of Education, National Center for Education Statistics, "School Problems and Reading Performance," *Survey Report*, forthcoming.

Supplemental note 1:21.–School problems and reading performance

This indicator is based on data from the 1983–84 National Assessment of Educational Progress (NAEP) in reading. The sample is nationally representative of school children aged 9, 13, and 17 and in grades 4, 8, and 11. See the Data Sources section for further information on NAEP.

In 1983–84, NAEP also included a broad set of student, teacher, and school survey questions. The student demographic characteristics and home environment data used in this analysis were reported by the student: language spoken in the home, family education, and the presence of various reading aids in the home (the sum of "yes" answers to the presence of newspapers, dictionaries, encyclopedias, 25 or more books, magazines, and computers in the home).

Information about the students' schools was collected from a questionnaire filled out by the school's principal. The school problems information was gathered by asking principals the following question:

Below is a partial list of school problems. To what degree are they characteristic of your school?

	Serious	Moderate	Minor	Not a problem
Student absenteeism	A	B	C	D
Lack of parent interest	A	B	C	D
Discipline	A	B	C	D
Lack of teacher commitment or motivation	A	B	C	D
Teacher absenteeism	A	B	C	D
Teacher turnover	A	B	C	D
Low standards for students	A	B	C	D
Vandalism	A	B	C	D

Responses to these items were coded as follows: 1 for "not a problem," 2 for "minor" problem, 3 for "moderate" problem, and 4 for "serious" problem.

The average-rating-of-school-problems variable is the average for each school of principals' ratings of the eight school problem items. The averages were grouped as follows:

1 = averages greater than or equal to 1 and less than 1.5;

2 = averages greater than or equal to 1.5 and less than 2.5;

3 = averages greater than or equal to 2.5.

The observed and adjusted reading proficiency scale scores are the result of regression analysis predicting reading proficiency scale scores from principals' average ratings of school problems. First, a bivariate regression of reading scale scores by average rating of school problems was computed as the basis for the observed reading scores. Then a multiple regression of reading scale scores by student background characteristics and average rating of school problems was computed as the basis for the adjusted reading scores. The adjusted reading scores represent the predicted average reading scale scores for levels of the average rating on school problems after taking student background characteristics into account. For further information on this indicator, see U.S. Department of Education, National Center for Education Statistics, "School Problems and Reading Performance," *Survey Report*, forthcoming.

Table 1:22-1.—Teachers who think that each of several factors is a "major cause" of students' difficulties in school, by wealth of district: 1987

Cause	Total teachers	Wealth of district Above average	Wealth of district Average for State	Wealth of district Below average
		Number		
Total	1,002	223	424	342
		Percent		
Children left on their own after school	51	54	52	48
Poverty in the student's home	47	42	42	54
Automatic promotion to next grade	44	36	46	48
Teachers not adapting to individual student needs	43	40	46	40
Single parent families	42	46	43	40
Boring curriculum	34	29	36	34
Families where both parents work full time	25	25	26	25

SOURCE: *The Metropolitan Life Survey of The American Teacher 1987: Strengthening Links Between Home and School.*

Table 1:22-2.—Parents and teachers who think that each of several steps would "help a lot" to improve education: 1987

Step	Parents	Teachers
	Number	
Total	2,011	1,002
	Percent	
Having the school notify parents immediately about problems involving their child	88	77
Having parents limit television until all homework is finished	79	80
Having parents spend much more time with their children in support of school and teachers	70	84
Distributing a newsletter to parents about what's happening in school	68	51
Establishing a homework hotline students can call for homework advice	64	42
Having the school guide teachers more about how to involve parents better in the future	60	41
Getting teachers and parents to meet and talk about school policies	58	52

SOURCE: *The Metropolitan Life Survey of The American Teacher 1987: Strengthening Links Between Home and School.*

Table 1:22-3.—Criticisms that parents and teachers think are valid for many parents: 1987

Criticism	Parents	Teachers
	Number	
Total	2,011	1,002
	Percent saying "most" or "many"	
Leave their children alone too much on their own after school	59	62
Fail to discipline their children	58	51
Fail to motivate their children so that they want to learn in school	52	53
Take too little interest in their children's education	52	48
Neglect to see that their children's homework gets done	49	50
Fail to show respect for teachers	34	23
Set too high or too strict a standard for their children to meet	30	12

SOURCE: *The Metropolitan Life Survey of The American Teacher 1987: Strengthening Links Between Home and School.*

Table 1:22-4.—Characteristics of children, by frequency with which they are left alone after school, according to parents: 1987

Characteristic	Number of parents responding	How often the child is left alone after school: Never	1 or 2 days a week	Almost every day
		Percent of parents responding		
Total parents	2,011	58	17	24
Child's school level				
Elementary	898	75	13	12
Junior high	368	53	17	30
High school	503	40	21	38
Size of place				
Central city	490	58	14	26
Rest of metro area	963	59	17	23
Outside metro area	558	57	19	24
Race				
White	1,573	59	17	23
Black	211	51	17	31
Hispanic	150	62	15	21
Education of parent				
Less than high school	238	59	11	29
High school graduate	813	63	16	21
Some college	440	52	22	25
4-year college graduate	309	56	17	26
Beyond college	208	52	25	22

Table 1:22-4.—Characteristics of children, by frequency with which they are left alone after school, according to parents: 1987—Continued

Characteristic	Number of parents responding	Never	1 or 2 days a week	Almost every day
		Percent of parents responding		
Status of parents				
One-parent families				
Not working	80	68	9	23
Work part time	64	48	17	35
Work full time	291	45	14	40
Two-parent families				
One not working	533	74	13	12
Both work, one part time	417	60	26	13
Both work full time	626	49	18	32
Family income				
$7,500 or less	130	59	12	28
$7,501 to $15,000	198	58	11	29
$15,001 to $25,000	397	60	15	24
$25,001 to $35,000	420	60	22	17
$35,001 to $50,000	436	57	18	24
$50,001 and over	305	52	21	26

SOURCE: *The Metropolitan Life Survey of the American Teacher, 1987: Strengthening Links Between Home and School.*

Table 1:22-5.—Sampling tolerances for percents from Metropolitan Life polls (tables 1:22-1 to 1:22-4)

Percents	Recommended allowance for sampling error of a percent							
	Size of sample							
	2,000	1,500	1,000	800	600	400	200	100
	In percentage points (at 95 percent confidence)							
Near 10 or 90	1	2	2	2	2	3	4	6
Near 20 or 80	2	2	2	3	3	4	6	8
Near 30 or 70	2	2	3	3	4	4	6	9
Near 40 or 60	2	3	3	3	4	5	7	10
Near 50	2	3	3	3	4	5	7	10

SOURCE: *The Metropolitan Life Survey of The American Teacher 1987: Strengthening Links Between Home and School.*

Table 1:22-6.—Sampling tolerances for percent differences from Metropolitan Life polls (tables 1:22-1 to 1:22-4)

Sample size	Recommended allowance for sampling error of a percent difference — Size of sample: 2,000	1,000	800	500	300	100
	In percentage points (at 95 percent confidence)					
	Percents near 20 or 80					
1,000	3	4	4	4	5	8
800	3	4	4	4	5	8
500	4	4	4	4	6	9
300	5	5	5	6	6	9
100	8	8	8	9	9	11
	Percents near 50					
1,000	4	4	5	5	6	10
800	4	5	5	6	7	10
500	5	5	6	6	7	11
300	6	6	7	7	8	11
100	10	10	10	11	11	14

SOURCE: *The Metropolitan Life Survey of The American Teacher 1987: Strengthening Links Between Home and School.*

Indicator 1:23

Table 1:23-1. – The public's rating of the schools – percent giving the schools an A, B, C, D, or F: 1977–1987

	Rating of local schools							Rating of the Nation's schools						
Year	A	B	C	D	F	Don't know	Average grade¹	A	B	C	D	F	Don't know	Average grade¹
1977	11	26	28	11	5	19	2.33	—	—	—	—	—	—	—
1978	9	27	30	11	8	15	2.21	—	—	—	—	—	—	—
1979	8	26	30	11	7	18	2.21	—	—	—	—	—	—	—
1980	10	25	29	12	6	18	2.26	—	—	—	—	—	—	—
1981	9	27	34	13	7	10	2.20	2	18	43	15	6	16	1.94
1982	8	29	33	14	5	11	2.24	2	20	44	15	4	15	2.01
1983	6	25	32	13	7	17	2.12	2	17	38	16	6	21	1.91
1984	10	32	35	11	4	8	2.36	2	23	49	11	4	11	2.09
1985	9	34	30	10	4	13	2.39	3	24	43	12	3	15	2.14
1986	11	30	28	11	5	15	2.36	3	25	41	10	5	16	2.13
1987	12	31	30	9	4	14	2.44	4	22	44	11	2	17	2.18

— Not available.

¹Average grades do not include "don't know" responses.

SOURCE: George H. Gallup, "The 19th Annual Gallup Survey of the Public's Attitudes Toward the Public Schools," *Phi Delta Kappan*, September 1987.

Table 1:23-2.—The public's confidence in selected institutions: Selected years, 1973–1987

Institution	1973	1975	1977	1979	1981	1983	1985	1986	1987
	Percent having a "great deal" or "quite a lot" of confidence								
Church	66	68	65	65	64	62	66	57	61
Military	—	58	57	54	50	53	61	63	61
Supreme Court	44	49	46	45	46	42	56	53	52
Banks	—	—	—	60	46	51	51	49	51
Schools	58	—	54	53	42	39	48	49	50
Congress	42	40	40	34	29	28	39	41	—
Newspapers	39	—	—	51	35	38	35	37	31
Big business	26	34	33	32	20	28	31	28	—
Television	37	—	—	38	25	25	29	27	28
Labor	30	38	39	36	28	26	28	29	26

— Not available.

SOURCE: The Gallup Poll, August 16, 1987.

Table 1:23-3.—Percent of the public grading the public schools A, B, C, D, or F, by type of school parent's child attends: 1987

Grade	Rating of the local public schools			Rating of the Nation's public schools		
	National totals	Public school parents	Nonpublic school parents	National totals	Public school parents	Nonpublic school parents
A	12	18	7	4	7	4
B	31	37	18	22	23	13
C	30	30	45	44	42	59
D	9	9	15	11	14	12
Fail	4	3	8	2	2	3
Don't know	14	2	7	17	12	9
Avg. grade[1]	2.44	2.61	2.01	2.18	2.22	2.03

[1] Average grades do not include "don't know" responses.

SOURCE: George H. Gallup, "The 19th Annual Gallup Survey of the Public's Attitudes Toward the Public Schools," Phi Delta Kappan, September, 1987.

Table 1:23-4.—Sampling tolerances for percents from Gallup Polls (tables 1:23-1 to 1:23-3)

	Recommended allowance for sampling error of a percent						
	Size of sample						
Percents	1,500	1,000	750	600	400	200	100
	In percentage points (at 95 percent confidence)						
Near 10 or 90	2	2	3	3	4	5	8
Near 20 or 80	2	3	4	4	5	7	10
Near 30 or 70	3	4	4	5	6	8	12
Near 40 or 60	3	4	4	5	6	9	12
Near 50	3	4	4	5	6	9	13

SOURCE: George H. Gallup, "The 19th Annual Gallup Survey of the Public's Attitudes Toward the Public Schools," *Phi Delta Kappan*, September 1987.

Table 1:23-5.—Sampling tolerances for percent differences from Gallup Polls (tables 1:23-1 to 1:23-3)

	Recommended allowance for sampling error of a percent difference			
	Size of sample			
Sample size	750	600	400	200
	Percents near 20 or 80			
750	5	6	6	8
600	6	6	7	8
400	6	7	7	9
200	8	8	9	10
	Percents near 50			
750	7	7	8	10
600	7	7	8	10
400	8	8	9	11
200	10	10	11	13

NOTE: Table entries are in percentage points (at 95 percent confidence).

SOURCE: George H. Gallup, "The 19th Annual Gallup Survey of the Public's Attitudes Toward the Public Schools," *Phi Delta Kappan*, September 1987.

Indicator 1:24

Table 1:24-1.—Average years of coursework required for high school graduation in private schools with grade 12: School year ending 1986

School characteristic	Subject area				
	Mathematics	Science	English	Foreign languages	Social studies
Total	2.8	2.5	3.9	1.2	3.1
Orientation					
Catholic	2.6	2.3	4.0	1.4	3.0
Other religious	2.8	2.6	3.9	.9	3.2
Nonsectarian	3.0	2.5	4.0	1.9	2.9
Type/level[1]					
Secondary	2.7	2.3	4.0	1.4	3.0
Combined	2.9	2.6	3.9	1.1	3.1
Other	2.8	2.7	4.0	1.0	3.4
Recommendations of National Commission on Excellence in Education[2]	3.0	3.0	4.0	[3]2.0	3.0

[1] Secondary and combined are regular schools, while other schools are primarily alternative schools. Secondary schools have no grade lower than 7, while combined schools have at least one grade lower than 7.

[2] An additional half year was recommended in computer science. However, data were not gathered about coursework requirements in computer science.

[3] The Commission's recommendations about foreign languages applied only to the college-bound, not to all students. The figures for actual requirements represent what was required for all students.

SOURCE: U.S. Department of Education, Center for Education Statistics, *Private Schools and Private School Teachers: Final Report of the 1985–86 Private School Study*, 1987.

Indicator 1:24

Table 1:24-2.—Average years of coursework required for high school graduation by public school districts with high schools, by subject area: School years ending 1982, 1985, and 1988

Item	Subject area				
	Mathematics	Science	English	Foreign languages	Social studies
1982	1.6	1.5	3.6	([1])	2.6
1985	1.9	1.8	3.8	0.1	2.8
1988[2]	2.3	2.0	3.9	.2	2.9
Recommendations of National Commission on Excellence in Education[3]	3.0	3.0	4.0	[4]2.0	3.0

[1] Less than 0.05 years.

[2] Expectations as of fall 1985 about requirements for seniors graduating in 1988.

[3] Another half year of coursework was recommended in computer science. Almost no school districts had requirements in this area in 1981–82. That situation changed by 1984–85, when the average for all school districts was 0.1 years of coursework required in computer science for graduation; the expected average for 1987–88 was 0.2 years.

[4] The Commission's recommendations about foreign languages applied only to the college-bound, not to all students. The figures for actual requirements represent requirements for all graduates.

SOURCE: U.S. Department of Education, National Center for Education Statistics, "Public High School Graduation Requirements," *OERI Bulletin*, 1986; and unpublished tabulations.

Table 1:24-3.—Number of courses required for high school graduation in 1980 and 1987, year effective, and increase in units required, by State: 1987

State	Number of units required, 1980	Number of units required, 1987	Year effective[1]	Change 1980–87
Alabama	20	22	1989	2
Alaska	19	21	1985	2
Arizona	16	20	1987	4
Arkansas	16	20	1988	4
California	([2])	13	1987	—
Colorado	Local boards determine		—	—
Connecticut	([2])	20	1988	—
Delaware	18	19	1987	1
District of Columbia	18	20.5	1985	2.5
Florida	([2])	24	1987	—
Georgia	20	21	1988	1
Hawaii	20	20	([3])	0
Idaho	18	20	1988	2
Illinois	16	16	([3])	0
Indiana	16	19.5	1989	3.5
Iowa	Local boards determine all but 2.5 units		—	—
Kansas	17	21	1989	4
Kentucky	18	20	1987	2
Louisiana	20	23	1989	3
Maine	16	16	([3])	0
Maryland	20	20	([3])	0
Massachusetts	Local boards determine all but 5 units		—	—
Michigan	Local boards determine all but .5 units		—	—
Minnesota	15	20	1982	5
Mississippi	16	18	1989	2
Missouri	20	22 or 24	1988	2 or 4
Montana	16	20	1986	4
Nebraska	160 semester hours	200 credit hours	1991	—
Nevada	19	22.5	1992	3.5
New Hampshire	16	19.75	1989	3.75
New Jersey	18.5	21.5	1992	3
New Mexico	20	23	1990	3
New York	16 or 18	18.5	1989	.5 or 2.5
North Carolina	16	20	1987	4
North Dakota	17	17	([3])	0

Table 1:24-3.—Number of courses required for high school graduation in 1980 and 1987, year effective, and increase in units required, by State: 1987—Continued

State	Number of units required, 1980	Number of units required, 1987	Year effective[1]	Change 1980–87
Ohio	17	18	1988	1
Oklahoma	10.5	15 or 20	1987 or 1988	4.5 or 9.5
Oregon	21	22	1988	1
Pennsylvania	13	21	1989	8
Rhode Island	16	16 or 18	1988 or 1989	0 or 2
South Carolina	18	20	1987	2
South Dakota	16	20	1989	4
Tennessee	18	20	1987	2
Texas	18	21 or 22	1988	3 or 4
Utah	15	24	1988	9
Vermont	—	14.5	1989	—
Virginia	18	20 or 22	1985 or 1988	2 or 4
Washington	—	19	1989	—
West Virginia	18	21	1989	3
Wisconsin	(2)	13	1989	—
Wyoming	18	18	(3)	0

— Not applicable or not available.

[1] Effective for the graduating class of this year.

[2] Local boards determine requirements.

[3] No change in requirements.

NOTE: Some States award more than one type of high school diploma, with each type requiring a different number of units.

SOURCE: Education Commission of the States, Department of Research and Information, "Minimum High School Graduation Course Requirements in the States," *Clearinghouse Notes*, November 1985; and unpublished data.

Table 1:24-4.—Standard errors for average years of coursework required for high school graduation in private schools with grade 12: School year ending 1986 (table 1:24-1)

School characteristic	Number of schools with grade 12	Subject area				
		Mathe-matics	Science	English	Foreign languages	Social studies
Total	8,464	0.1	0.1	0.02	0.1	0.1
Orientation						
Catholic	1,764	.1	.1	.01	.2	.1
Other religious	4,399	.2	.1	.03	.2	.1
Nonsectarian	2,301	.2	.1	.02	.1	.2
Type/level*						
Secondary	2,430	.1	.1	.02	.2	.1
Combined	4,046	.2	.1	.04	.2	.1
Other	1,987	.2	.2	.00	.4	.5

* Secondary and combined are regular schools, while other schools are primarily alternative schools. Secondary schools have no grade lower than 7, while combined schools have at least one grade lower than 7.

SOURCE: U.S. Department of Education, Center for Education Statistics, *Private Schools and Private School Teachers: Final Report of the 1985–86 Private School Study,* 1987; and unpublished tabulations.

Table 1:24-5.—Standard errors for average years of coursework required for high school graduation by public school districts with high schools: Selected school years ending 1982, 1985, and 1988 (table 1:24-2)

	Subject area[1]			
School year	Mathematics	Science	English	Social studies
1982	0.02	0.02	0.02	0.03
1985	.02	.03	.02	.02
1988[2]	.02	.02	.02	.02

[1] Standard errors are not available for foreign language coursework.

[2] Expectations as of fall 1985 about requirements for seniors graduating in 1988.

SOURCE: U.S. Department of Education, Center for Education Statistics, "Public High School Graduation Requirements," *OERI Bulletin*, 1986; and unpublished tabulations.

Indicator 1:25

Table 1:25-1.—High schools offering selected courses, by school size and type of community: School year ending 1986

Characteristic	Sample size (number)	Subject			
		Biology	Chemistry	Physics	Calculus
		Percent of schools			
Total	360	99	91	81	31
School size*					
Small	134	99	87	74	22
Medium	106	100	99	98	48
Large	120	97	98	94	57
Type of community					
Rural	128	99	88	75	18
Urban	106	97	90	85	39
Suburban	126	99	97	90	54

* Small = fewer than 800 students
Medium = 800–1,400 students
Large = more than 1,400 students

NOTE: A high school is defined as any school including at least one of grades 10 through 12.

SOURCE: Iris R. Weiss, *Report of the 1985–86 National Survey of Science and Mathematics Education*, Research Triangle Institute, 1987.

Table 1:25-2.—High schools offering 0, 1, 2, 3, 4, and 5 or more sections of selected courses: School year ending 1986

Course	Number of sections 0	1	2	3	4	5 or more
	Percent of schools					
Biology	1	23	16	14	6	40
Chemistry	9	35	18	9	6	23
Physics	19	52	13	6	5	5
Calculus	69	23	8	0	0	0

NOTE: A high school is defined as any school including at least one of grades 10 through 12.

SOURCE: Iris R. Weiss, *Report of the 1985–86 National Survey of Science and Mathematics Education*, Research Triangle Institute, 1987.

Table 1:25-3.—Standard errors and sample sizes for high schools offering selected courses, by school size and type of community: School year ending 1986 (table 1:25-1)

Characteristic	Sample size (number)	Subject			
		Biology	Chemistry	Physics	Calculus
		Standard error			
Total	360	0.8	2.3	3.2	3.8
School size*					
Small	134	1.3	4.5	5.9	5.5
Medium	106	.3	1.5	2.1	7.5
Large	120	2.4	2.0	3.4	7.0
Type of community					
Rural	128	1.4	4.4	5.9	5.3
Urban	106	2.4	4.5	5.4	6.7
Suburban	126	1.4	2.4	4.1	6.9

*Small = fewer than 800 students
Medium = 800–1,400 students
Large = more than 1,400 students

NOTE: A high school is defined as any school including at least one of grades 10 through 12.

SOURCE: Iris R. Weiss, *Report of the 1985–86 National Survey of Science and Mathematics Education*, Research Triangle Institute, 1987; and personal communication with the author.

Table 1:25-4.—Standard errors (and sample size) for high schools offering 0, 1, 2, 3, 4, and 5 or more sections of selected courses: School year ending 1986 (table 1:25-2)

Course	Number of sections					
	0	1	2	3	4	5 or more
	Standard error (sample size)					
Biology	0.0 (4)	3.4 (63)	3.0 (58)	2.8 (50)	1.9 (22)	4.0 (144)
Chemistry	2.3 (32)	3.9 (126)	3.1 (65)	2.3 (32)	1.8 (22)	3.4 (63)
Physics	3.2 (66)	4.1 (167)	2.8 (47)	1.9 (22)	1.8 (18)	1.8 (18)
Calculus	3.8 (248)	3.4 (63)	2.2 (29)	(0)	(0)	(0)

NOTE: A high school is defined as any school including at least one of grades 10 through 12.

SOURCE: Iris R. Weiss, *Report of the 1985-86 National Survey of Science and Mathematics Education*, Research Triangle Institute, 1987, and personal communication with the author.

Indicator 1:25

Supplemental note 1:25.—Availability of advanced mathematics and science courses in high school

The analysis for this indicator was based upon data from the 1985–86 National Survey of Science and Mathematics Education. Special tabulations were provided by Iris Weiss, author of the National Science Foundation report on the survey. Contingency tables were created of the percentage of high schools offering each of the four subjects (biology, chemistry, physics, and calculus), by size of community (small, medium, large) and type of community (rural, suburban, urban). A χ^2 analysis was performed on each of these four contingency tables to assess the independence of size of school and type of community with reference to the percentage of high schools offering the given course. Because the design effect (DEFF) of the school sample was relatively large (DEFF = 2.4), the χ^2 value obtained for each contingency table was divided by the DEFF before analyzing the statistical significance of the test. After assessing this penalty, the χ^2 result was nonsignificant for biology, chemistry, and physics, but was still significant for calculus ($\chi^2 = 7.38$, p.05). The actual and expected contingency tables for calculus are shown below.

	High schools offering calculus		
Size	Urban	Suburban	Rural
		Actual percent	
Small	28	48	19
Medium	38	62	42
Large	57	84	60
		Expected percent	
Small	28	36	27
Medium	42	58	43
Large	51	71	52

Indicator 1:26

Table 1:26-1.—States that have enacted testing programs for initially certifying teachers: Fall 1987

State	Enacted	Effective	Test used[1]
Alabama	1980	1981	State
Arizona	1980	1980	State
Arkansas	1979	1983	NTE
California	1981	1982	CBEST
Colorado	1981	1983	CAT
Connecticut	1982	1985	State
Delaware	1982	1983	PPST
Florida	1978	1980	State
Georgia	1975	1980	State
Hawaii	1986	1986	NTE
Idaho	1987	1988	NTE
Illinois	1985	1988	State
Indiana	1984	1985	NTE
Kansas	1984	1986	NTE and PPST
Kentucky	1984	1985	NTE
Louisiana	1977	1978	NTE
Maine	1984	1988	NTE
Maryland	1986	1986	NTE
Massachusetts	1985	(2)	(2)
Michigan	1986	1991	(2)
Minnesota	1986	1988	PPST
Mississippi	1975	1977	NTE
Missouri	1985	1988	(2)
Montana	1985	1986	NTE
Nebraska	1984	1989	(2)

Indicator 1:26

Table 1:26-1.—States that have enacted testing programs for initially certifying teachers: Fall 1987—Continued

State	Enacted	Effective	Test Used[1]
Nevada	1984	1989	PPST and State
New Hampshire	1984	1985	PPST and NTE
New Jersey	1984	1985	NTE
New Mexico	1981	1983	NTE
New York	1980	1984	NTE
North Carolina	1964	1964	NTE
North Dakota	1986	([2])	([2])
Ohio	1986	1987	NTE
Oklahoma	1980	1982	State
Oregon	1984	1985	CBEST
Pennsylvania	1985	1987	State
Rhode Island	1985	1986	NTE
South Carolina	1979	1982	NTE and State
South Dakota	1985	1986	NTE
Tennessee	1980	1981	NTE
Texas	1981	1986	State
Virginia	1979	1980	NTE
Washington	1984	([2])	([2])
West Virginia	1982	1985	State
Wisconsin	1986	1990	([2])

[1] Tests:
CAT = California Achievement Test.
CBEST = California Basic Skills Test.
NTE = National Teacher Examination.
PPST = Pre-Professional Skills Test.
State = State-developed test.

[2] To be determined.

SOURCES: U.S. Department of Education, Office of Research, *What's Happening in Teacher Testing: 1987*, August 1987; Education Commission of the States, personal communication with the author.

Table 2:1-1.—Changes in performance on Graduate Record Examinations: Long-term and short-term trends

Test[1]	Change in standard deviation units Long-term (1964–1987)	 Short-term (1976–1987)
Mathematics	0.37	0.12
Physics	.13	–.10
Quantitative	.12	.26
Engineering	.01	.23
Chemistry	.01	–.01
Biology	–.01	–.08
Computer science	—	–.07
Economics	–.10	.07
Education	–.18	.13
Psychology	–.21	.04
Music	–.22	.05
Geology[2]	–.31	–.08
Verbal	–.42	–.10
Literature in English	–.67	–.06
History	–.74	–.08
Sociology	–1.04	–.22
Political science	–1.14	–.23

— Not applicable. Tests in this area began in 1976.

[1] Quantitative and Verbal are general examinations while all others are area tests.

[2] Geology area test long-term trend was calculated for the period 1967-87.

NOTE: A change in the range of –0.10 to +0.10 is really no change. Changes exceeding –0.4 or +0.4 are large.

SOURCE: U.S. Department of Education, Office of Research, *The Standardized Test Scores of College Graduates, 1964–1982*, 1985, and special tabulations.

Supplemental note 2:1.–An analysis of changes in performance on Graduate Record Examinations

The Office of Research (OR) in the Office for Educational Research and Improvement (OERI) has analyzed changes over two decades in performance on graduate and professional school admissions tests. In the analysis, change is measured against the mean standard deviation for a specific time period. Standard deviation units are a far more accurate way of measuring change in performance over time for these tests than either scores or percentages, principally because (a) no two of these examinations have the same scales, and (b) the standard deviation accounts for the different ranges in scores among the many groups of students who took these examinations over a long period of time.

The four major college graduate examinations with a national data base examined are these: the Law School Admissions Test (LSAT), the Medical College Admissions Test (MCAT), the Graduate Management Admissions Test (GMAT), and the Graduate Record Examination (GRE). While the combination of those taking the LSAT, the MCAT, and the GMAT is greater in number, the GRE scores are more reliable historical measures of student achievement. The GRE battery has remained fairly constant in content and skills coverage, and unlike the LSAT or MCAT, the scales of the various GRE examinations have not undergone radical alteration since their introduction.

However, while the GRE is the best historical measure, several aspects of the GRE battery make it an imperfect measure of overall college outcomes. These limitations include the following:

- Sampling: The composition of the GRE test-taking group has become more complex in recent years. While fewer than 15 percent of U.S. college graduates in any one year take one or more exams in the GRE battery, the longitudinal study of the high school graduating class of 1972 indicates that 23 percent of those who graduated from college took the GRE by 1986. Those who take GRE tests usually plan to attend graduate schools that require or recommend one or more of the GRE tests as part of the admissions application. Others take them as part of their application for specific fellowships. And still others take them to fulfill graduation requirements in some colleges. The sample of test-takers is thus largely self-selected and, as such, its scores will not reflect the overall quality of undergraduate education in the United States.

- Test content: The GRE General Examination measures "general learned abilities" such as reading comprehension, quantitative reasoning, and problem solving. Colleges teach—and students learn—a great deal more than this. Even the content of the subject area examinations does not always represent of what some colleges teach in specific fields. Colleges also seek to foster the development of other general learned abilities, such as how to synthesize information and how to be creative, which are not tested in the General Examinations. Thus, the results of the GREs do not reflect the full range of student learning in U.S. colleges and universities.

Real gains: The GRE scores do not indicate the extent to which students have improved their general learned abilities between their entrance to and graduation from college. Since the scores of seniors are not statistically controlled by measures of their ability as freshmen, no conclusions can be made about the quality of education that has taken place during the period of their enrollment in college. The Office of Research is currently sponsoring a study involving both the statistical controls and transcript analysis that should provide guidelines for analyzing improvements in general learned abilities of students in different types of colleges.

Standard deviation unit differences for this indicator were calculated using the following steps: 1) averaging the standard deviations for each test for each of the years in the period (e.g., 1976–77 through 1986–87); 2) calculating the difference in the mean GRE subtest score for the first and last years of the period (e.g., mean verbal score for 1986–87 minus mean verbal score for 1976–77); and 3) dividing the difference in the mean score over the period by the average standard deviation over the period to obtain the difference score in standard deviation units.

Those interested in further information may refer to the Office of Research publication, *The Standardized Test Scores of College Graduates, 1964–1982*, 1985, or contact:

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Office of Educational Research and Improvement
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Table 2:2-1.—Years of college completed by population 25–34 years old, by race/ethnicity: 1970–1987

Year (March)	All	White	Black	Hispanic*
		Percent who completed 1 or more years		
1970	29.8	31.2	15.0	–
1971	31.3	32.8	16.3	–
1972	33.3	34.8	18.7	–
1973	34.2	35.5	20.4	–
1974	37.4	38.7	23.0	18.7
1975	39.4	40.4	25.9	19.6
1976	41.3	42.7	24.9	20.9
1977	43.6	45.1	28.6	21.9
1978	44.8	46.1	32.6	22.7
1979	45.5	47.0	31.3	23.1
1980	45.8	47.2	33.6	23.6
1981	44.9	45.9	34.1	24.4
1982	45.2	46.2	35.8	23.8
1983	46.2	47.3	33.0	24.7
1984	45.6	47.1	32.8	26.0
1985	45.8	46.8	35.3	25.6
1986	45.7	46.6	36.2	24.9
1987	45.4	46.3	35.0	27.1
		Percent who completed 2 or more years		
1970	24.3	25.4	11.7	–
1971	25.2	26.5	12.2	–
1972	27.0	28.2	13.9	–
1973	27.8	29.0	14.6	–
1974	30.7	32.0	16.0	13.8
1975	32.2	33.2	19.4	13.5
1976	33.8	35.0	18.9	14.7
1977	35.9	37.3	21.1	15.3
1978	36.8	38.1	24.1	16.9
1979	37.3	38.7	23.7	17.1
1980	37.6	38.9	24.9	17.8

Table 2:2-1.—Years of college completed by population 25-34 years old, by race/ethnicity: 1970-1987—Continued

Year (March)	All	White	Black	Hispanic*
	Percent who completed 2 or more years (cont.)			
1981	36.8	37.8	25.5	17.8
1982	37.4	38.4	27.3	18.7
1983	38.4	39.5	25.3	19.4
1984	37.7	39.1	24.7	19.7
1985	37.8	38.7	28.0	19.5
1986	38.0	38.9	28.5	19.5
1987	37.8	38.7	26.6	21.2
	Percent who completed 4 or more years			
1970	15.8	16.6	6.1	—
1971	16.3	17.2	6.3	—
1972	17.9	18.8	7.9	—
1973	18.2	19.0	8.3	—
1974	20.0	21.0	8.1	5.7
1975	21.4	22.2	10.7	7.0
1976	22.6	23.5	11.3	7.4
1977	23.8	25.0	11.4	6.9
1978	23.6	24.8	11.4	8.8
1979	23.8	24.9	12.8	7.8
1980	24.1	25.4	12.4	8.9
1981	23.2	24.3	11.7	8.8
1982	23.8	24.9	12.6	9.7
1983	24.4	25.5	13.6	10.2
1984	24.3	25.5	13.1	10.1
1985	23.8	24.8	13.7	10.5
1986	24.0	25.1	13.6	9.9
1987	23.9	25.1	12.3	9.8

— Not available.

* Hispanics may be of any race.

SOURCE: U.S. Department of Commerce, Bureau of the Census, "Educational Attainment in the United States," various years, *Current Population Reports*. Series P-20; and unpublished tabulations from the March supplement to the Current Population Survey.

Table 2:2-2.—Standard errors for years of college completed by population 25-34 years old, by race/ethnicity: 1970-1987 (table 2:2-1)

Year (March)	All	White	Black	Hispanic*
		1 or more years		
1970	0.4	0.4	1.0	—
1971	.4	.4	1.1	—
1972	.4	.4	1.1	—
1973	.4	.4	1.1	—
1974	.4	.4	1.2	1.4
1975	.4	.4	1.2	1.4
1976	.4	.4	1.2	1.4
1977	.4	.4	1.2	1.4
1978	.4	.4	1.2	1.4
1979	.4	.4	1.2	1.4
1980	.4	.4	1.2	1.3
1981	.4	.4	1.2	1.2
1982	.4	.4	1.2	1.2
1983	.4	.4	1.1	1.2
1984	.4	.4	1.1	1.2
1985	.4	.4	1.1	1.3
1986	.4	.4	1.1	1.2
1987	.4	.4	1.1	1.2

Table 2:2-2.—Standard errors for years of college completed by population 25–34 years old, by race/ethnicity: 1970–1987 (table 2:2-1)—Continued

Year (March)	All	White	Black	Hispanic*
		2 or more years		
1970	.4	.4	.9	—
1971	.4	.4	.9	—
1972	.4	.4	1.0	—
1973	.4	.4	1.0	—
1974	.4	.4	1.0	1.2
1975	.4	.4	1.1	1.2
1976	.4	.4	1.0	1.2
1977	.4	.4	1.1	1.2
1978	.4	.4	1.1	1.2
1979	.4	.4	1.1	1.2
1980	.4	.4	1.1	1.2
1981	.4	.4	1.1	1.1
1982	.4	.4	1.1	1.1
1983	.4	.4	1.0	1.1
1984	.4	.4	1.0	1.1
1985	.4	.4	1.0	1.2
1986	.4	.4	1.0	1.1
1987	.4	.4	1.0	1.1

Table 2:2-2.—Standard errors for years of college completed by population 25–34 years old, by race/ethnicity: 1970–1987 (table 2:2-1)—Continued

Year (March)	All	White	Black	Hispanic*
		4 or more years		
1970	0.3	0.4	0.7	—
1971	.3	.4	.7	—
1972	.3	.4	.8	—
1973	.3	.4	.8	—
1974	.3	.4	.8	0.8
1975	.3	.4	.8	.9
1976	.3	.4	.8	.9
1977	.3	.4	.8	.9
1978	.3	.4	.8	.9
1979	.3	.4	.8	.9
1980	.3	.4	.8	.9
1981	.3	.4	.8	.8
1982	.3	.4	.8	.8
1983	.3	.4	.8	.8
1984	.3	.4	.8	.8
1985	.3	.4	.8	.9
1986	.3	.4	.8	.8
1987	.3	.4	.7	.8

—Not available.

*Hispanics may be of any race.

SOURCE: U.S. Department of Commerce, Bureau of the Census, "Educational Attainment in the United States," various years, *Current Population Reports*. Series P-20; and unpublished tabulations from the March supplement to the Current Population Survey.

Table 2:3-1.—Number of degrees awarded at institutions of higher education, by level of education: Academic years ending 1971–1986

Year	Total	Associate degrees	Bachelor's degrees	Master's degrees	Doctor's degrees	First-professional degrees
1971	1,392,902	252,610	839,730	230,509	32,107	37,946
1972	1,507,799	292,119	887,273	251,633	33,363	43,411
1973	1,586,702	316,174	922,362	263,371	34,777	50,018
1974	1,654,365	343,924	945,776	277,033	33,816	53,816
1975	1,665,553	360,171	922,933	292,450	34,083	55,916
1976	1,725,684	391,454	925,746	311,771	34,064	62,649
1977	1,740,681	406,377	919,549	317,164	33,232	64,359
1978	1,743,782	412,246	921,204	311,620	32,131	66,581
1979	1,726,749	402,702	921,390	301,079	32,730	68,848
1980	1,731,154	400,910	929,417	298,081	32,615	70,131
1981	1,752,170	416,377	935,140	295,739	32,958	71,956
1982	1,787,798	434,515	952,998	295,546	32,707	72,032
1983	1,821,783	456,441	969,510	289,921	32,775	73,136
1984	1,818,604	452,416	974,309	284,263	33,209	74,407
1985	1,828,446	454,712	979,477	286,251	32,943	75,063
1986	1,830,000	446,047	987,823	288,567	33,653	73,910

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1988* (based on the HEGIS survey Degrees and Other Formal Awards Conferred, various years).

Table 2:3-2.—Percentage distribution of degrees awarded at institutions of higher education, by level of education: Academic years ending 1971–1986

Year	Total	Associate degrees	Bachelor's degrees	Master's degrees	Doctor's degrees	First-professional degrees
1971	100.0	18.1	60.3	16.5	2.3	2.7
1972	100.0	19.4	58.8	16.7	2.2	2.9
1973	100.0	19.9	58.1	16.6	2.2	3.2
1974	100.0	20.8	57.2	16.7	2.0	3.3
1975	100.0	21.6	55.4	17.6	2.0	3.4
1976	100.0	22.7	53.6	18.1	2.0	3.6
1977	100.0	23.3	52.8	18.2	1.8	3.7
1978	100.0	23.6	52.8	17.9	1.9	3.8
1979	100.0	23.3	53.4	17.4	1.9	4.0
1980	100.0	23.2	53.7	17.2	1.9	4.1
1981	100.0	23.8	53.4	16.9	1.9	4.1
1982	100.0	24.3	53.3	16.5	1.8	4.0
1983	100.0	25.1	53.2	15.9	1.8	4.0
1984	100.0	24.9	53.6	15.6	1.8	4.1
1985	100.0	24.9	53.6	15.7	1.8	4.1
1986	100.0	24.4	54.0	15.8	1.8	4.0

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1988* (based on the HEGIS survey Degrees and Other Formal Awards Conferred, various years).

Table 2:6-1.—Bachelor's degrees conferred, by field: Academic years ending 1971–1986

Field	1971	1972	1973	1974
Total	839,730	887,273	922,362	945,776
Arts and sciences	418,080	435,038	445,870	446,036
Sciences	270,275	285,881	286,310	290,075
Physical and biological sciences	81,858	81,701	82,288	81,104
Social sciences	189,118	201,180	200,317	202,118
Humanities	150,511	149,158	153,560	152,860
Technical/professional	421,197	452,204	476,488	498,241
Business	115,856	121,860	126,263	131,766
Education	176,319	191,220	194,229	185,225
Other technical/professional	129,022	140,004	156,007	179,250
Computer and information sciences	2,388	3,402	4,304	4,756
Engineering and engineering technologies	50,046	51,189	51,265	50,286
Other	77,004	86,388	100,438	124,208

Field	1975	1976	1977	1978
Total	922,933	925,746	919,549	921,204
Arts and sciences	396,360	418,038	402,785	387,313
Sciences	270,850	287,316	284,250	286,960
Physical and biological sciences	82,700	81,759	82,068	81,907
Social sciences	188,150	176,180	165,050	157,883
Humanities	125,880	120,312	118,516	115,187
Technical/professional	499,201	507,415	518,764	532,084
Business	130,310	135,076	150,884	160,187
Education	167,312	154,807	140,725	136,151
Other technical/professional	190,898	210,328	224,298	237,068
Computer and information sciences	5,033	5,652	6,407	7,201
Engineering and engineering technologies	46,852	46,331	49,283	56,254
Other	139,013	158,345	168,608	173,613

Indicator 2:6

Table 2:6-1.—Bachelor's degrees conferred, by field: Academic years ending 1971–1986—Continued

Field	1979	1980	1981	1982
Total	[illegible]	[illegible]	[illegible]	[illegible]
Arts and sciences	[illegible]	[illegible]	[illegible]	[illegible]
Sciences	[illegible]	[illegible]	[illegible]	[illegible]
Physical and biological sciences	[illegible]	[illegible]	[illegible]	[illegible]
Social sciences	[illegible]	[illegible]	[illegible]	[illegible]
Humanities	[illegible]	[illegible]	[illegible]	[illegible]
Technical and professional	[illegible]	[illegible]	[illegible]	[illegible]
Business	[illegible]	[illegible]	[illegible]	[illegible]
Education	[illegible]	[illegible]	[illegible]	[illegible]
Other technical and professional	[illegible]	[illegible]	[illegible]	[illegible]
Computer and information sciences	[illegible]	[illegible]	[illegible]	[illegible]
Engineering and engineering technologies	[illegible]	[illegible]	[illegible]	[illegible]
Other	[illegible]	[illegible]	[illegible]	[illegible]

Table 2:6-1.—Bachelor's degrees conferred, by field: Academic years ending 1971–1986—Continued

Field	1983	1984	1985	1986
Total	[illegible]	[illegible]	[illegible]	[illegible]
Arts and sciences	[illegible]	[illegible]	[illegible]	[illegible]
Sciences	[illegible]	[illegible]	[illegible]	[illegible]
Physical and biological sciences	[illegible]	[illegible]	[illegible]	[illegible]
Social sciences	[illegible]	[illegible]	[illegible]	[illegible]
Humanities	[illegible]	[illegible]	[illegible]	[illegible]
Technical and professional	[illegible]	[illegible]	[illegible]	[illegible]
Business	[illegible]	[illegible]	[illegible]	[illegible]
Education	[illegible]	[illegible]	[illegible]	[illegible]
Other technical and professional	[illegible]	[illegible]	[illegible]	[illegible]
Computer and information sciences	[illegible]	[illegible]	[illegible]	[illegible]
Engineering and engineering technologies	[illegible]	[illegible]	[illegible]	[illegible]
Other	[illegible]	[illegible]	[illegible]	[illegible]

NOTES: [illegible]

[illegible]

SOURCE: [illegible]

Indicator 2:9

Table 2:9-1.—Master's degrees conferred by institutions of higher education, by field: Academic years ending 1971–1986

Field	1971	1972	1973	1974	1975	1976
Total	230,509	251,633	263,371	277,033	292,450	311,771
Arts and sciences	67,256	70,603	70,613	72,513	72,243	70,788
Sciences	40,153	41,391	40,667	41,285	40,642	39,540
Physical and biological sciences	17,086	17,688	17,549	17,448	16,684	15,905
Social sciences	23,067	23,703	23,118	23,837	23,958	23,635
Humanities	26,552	29,212	29,946	31,228	31,601	31,248
Technical/professional	163,253	180,030	192,758	204,520	220,207	240,983
Business	26,481	30,867	31,007	32,644	36,247	42,512
Education	88,952	96,163	103,593	112,610	120,150	126,917
Other technical/professional	47,221	52,020	58,156	59,266	63,781	71,554
Computer and information sciences	1,588	1,977	2,113	2,276	2,299	2,603
Engineering and engineering technologies	16,443	16,030	18,610	15,379	15,348	16,342
Other	29,220	33,993	37,434	41,611	46,144	51,109

Field	1977	1978	1979	1980	1981	1982
Total	317,164	311,620	301,079	298,081	295,739	295,546
Arts and sciences	70,766	68,032	64,307	63,177	61,702	61,876
Sciences	38,636	36,179	36,128	34,488	33,682	33,700
Physical and biological sciences	15,140	14,160	15,318	14,589	13,829	14,113
Social sciences	23,496	22,130	20,810	19,807	19,853	19,583
Humanities	32,540	31,116	28,379	28,681	28,020	28,176
Technical/professional	246,398	243,528	236,772	234,904	234,037	233,670
Business	46,505	48,328	50,372	55,008	57,888	61,299
Education	126,905	118,538	111,893	103,951	98,938	93,757
Other technical/professional	72,194	76,664	74,208	75,947	77,201	78,616
Computer and information sciences	2,798	3,038	3,003	3,647	4,218	4,936
Engineering and engineering technologies	16,545	16,908	15,485	16,243	16,709	17,838
Other	54,851	56,578	55,655	56,057	56,274	55,842

Table 2:5-1—Masters' degrees conferred by institutions of higher education, by field: Academic years ending 1971–1986—Continued

Field	1983	1984	1985	1986
Total	289,921	284,263	286,251	288,567
Arts and sciences	60,099	59,769	59,659	60,038
Sciences	33,313	32,190	32,525	32,795
Physical and biological sciences	13,823	13,723	13,737	14,074
Social sciences	19,490	18,467	18,788	18,721
Humanities	26,786	27,579	27,134	27,243
Technical/professional	229,822	224,494	226,592	228,529
Business	65,319	66,653	67,527	67,137
Education	84,853	77,187	76,137	76,353
Other technical/professional	79,650	80,654	82,928	85,039
Computer and information sciences	5,321	6,190	7,101	8,070
Engineering and engineering technologies	19,350	20,661	21,557	21,661
Other	54,979	53,803	54,270	55,308

NOTE: Beginning in 1982–83, the taxonomy used to collect data on earned degrees by major field was revised. The figures for earlier years have been revised when necessary to reflect the new taxonomy.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1988* (based on the HEGIS survey Degrees and Other Formal Awards Conferred), various years).

Table 2:5-2.—Doctor's degrees conferred by institutions of higher education, by field: Academic years ending 1971–1986

Field	1971	1972	1973	1974	1975	1976
Total	32,107	33,363	34,777	33,816	34,083	34,064
Arts and sciences	19,035	19,586	20,414	19,825	19,944	19,830
Sciences	14,675	14,843	15,029	14,555	14,636	14,414
Physical and biological sciences	9,234	8,884	8,710	8,096	7,805	7,679
Social sciences	5,441	5,959	6,319	6,459	6,831	6,735
Humanities	4,360	4,743	5,385	5,270	5,308	5,416
Technical/professional	13,072	13,777	14,363	13,991	14,139	14,234
Business	807	896	923	981	1,009	953
Education	6,403	7,044	7,318	7,293	7,446	7,778
Other technical/professional	5,862	5,837	6,122	5,717	5,684	5,503
Computer and information sciences	128	167	196	198	213	244
Engineering and engineering technologies	3,638	3,671	3,492	3,312	3,108	2,821
Other	2,096	1,999	2,434	2,207	2,363	2,438

Field	1977	1978	1979	1980	1981	1982
Total	33,232	32,131	32,730	32,615	32,958	32,707
Arts and sciences	19,293	18,440	18,730	18,385	18,635	18,217
Sciences	14,126	13,417	13,294	13,436	13,896	13,551
Physical and biological sciences	7,581	7,376	7,274	7,449	7,887	7,710
Social sciences	6,545	6,170	6,020	5,987	6,009	5,841
Humanities	5,167	5,023	5,436	4,949	4,739	4,666
Technical/professional	13,939	13,691	14,000	14,230	14,323	14,490
Business	863	866	860	792	842	818
Education	7,963	7,595	7,736	7,941	7,900	7,680
Other technical/professional	5,113	5,230	5,404	5,497	5,581	5,992
Computer and information sciences	216	196	236	240	252	251
Engineering and engineering technologies	2,586	2,440	2,506	2,507	2,561	2,636
Other	2,311	2,594	2,662	2,750	2,768	3,105

Table 2:5.2—Doctor's degrees conferred by institutions of higher education, by field: Academic years ending 1971-1986—Continued

Field	1983	1984	1985	1986
Total	32,775	33,209	32,943	33,653
Arts and sciences	17,910	17,936	17,745	18,253
Sciences	13,347	13,322	13,293	13,894
Physical and biological sciences	7,308	7,438	7,534	7,851
Social sciences	6,039	5,884	5,759	6,043
Humanities	4,563	4,614	4,452	4,359
Technical/professional	14,865	15,273	15,198	15,400
Business	809	977	866	969
Education	7,551	7,473	7,151	7,110
Other technical/professional	6,505	6,823	7,181	7,321
Computer and information sciences	262	251	248	344
Engineering and engineering technologies	2,831	2,981	3,230	3,410
Other	3,412	3,591	3,703	3,567

NOTE: Beginning in 1982-83, the taxonomy used to collect data on earned degrees by major field was revised. The figures for earlier years have been revised when necessary to reflect the new taxonomy.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1989* (based on the HEGIS survey Degrees and Other Formal Awards Conferred, various years).

Table 2:6-1.—Activities of recent bachelor's degree recipients 1 year after graduation, by field of study and year of graduation: Academic years ending 1980 and 1984

Major field of study	Total		Employed full-time[1]		Military		Enrolled in school	
	1980	1984	1980	1984	1980	1984	1980	1984
	Percentage distribution							
Total	100	100	71	71	–	2	13	13
Technical/professional	100	100	80	78	–	2	7	7
Arts and sciences	100	100	56	55	–	2	24	25
Other	100	100	74	75	–	2	10	9
Technical/professional								
Engineering	100	100	84	79	–	6	8	10
Business and management	100	100	83	83	–	2	7	4
Health	100	100	77	73	–	1	6	9
Education	100	100	76	73	–	1	7	7
Public affairs/social services	100	100	77	71	–	4	10	9
Arts and sciences								
Biological sciences	100	100	46	45	–	(²)	35	38
Physical sciences/mathematics	100	100	59	45	–	7	30	36
Psychology	100	100	56	56	–	(²)	27	23
Social sciences	100	100	61	59	–	3	22	24
Humanities	100	100	56	58	–	1	17	19
Other								
Communications	100	100	71	76	–	1	6	6
Miscellaneous	100	100	75	75	–	2	11	10

Table 2:6-1.—Activities of recent bachelor's degree recipients 1 year after graduation, by field of study and year of graduation: Academic years ending 1980 and 1984—Continued

Major field of study	Unemployed		Not in labor force		Other	
	1980	1984	1980	1984	1980	1984
	Percentage distribution					
Total	6	3	3	5	7	7
Technical/professional	4	3	3	4	6	6
Arts and sciences	8	3	4	6	8	9
Other	5	4	4	5	7	5
Technical/professional						
Engineering	4	2	4	2	(²)	2
Business and management	4	3	2	4	4	3
Health	4	2	2	3	12	12
Education	4	2	3	4	9	13
Public affairs/social services	1	5	5	3	6	8
Arts and sciences						
Biological sciences	7	2	4	7	9	7
Physical sciences/mathematics	7	2	2	6	3	5
Psychology	7	4	2	7	7	10
Social sciences	7	3	4	4	6	7
Humanities	12	4	5	6	11	12
Other						
Communications	3	5	7	4	13	8
Miscellaneous	6	3	3	5	5	5

— Not applicable; data included with full-time employed.

[1] Military included in 1980.

[2] Less than 0.5 percent.

NOTE: Respondents were identified for their primary activity in the order listed. Those in "enrolled in school," for example, were enrolled but not working full time or serving in the military.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Recent College Graduates survey, various years, unpublished tabulations.

Table 2:6-2.—Coefficients of variation for estimates of bachelor's degree recipients 1 year after graduation, by major field of study: Academic year ending 1984 (table 2:6-1)

Major field of study	Employed full-time	Enrolled in school	Unemployed
		Percent	
All majors	0.6	3.6	6.0
Engineering	2.1	10.9	31.8
Business and management	1.0	9.7	13.7
Health professions	2.3	15.3	37.0
Education	1.9	4.3	19.7
Public affairs/social services	7.8	23.6	30.0
Biological sciences	9.8	9.6	33.9
Mathematics and physical sciences	4.3	4.9	16.8
Social sciences	3.2	8.4	16.7
Humanities	5.3	8.7	17.8
Psychology	6.9	12.8	26.3
Other fields	6.1	2.7	18.2

NOTE: The coefficient of variation of an estimate is the standard error of an estimate expressed as a percentage of the estimate. A standard error may be used to establish a confidence interval around an estimate. Multiplying the standard error of an estimate by 1.96 establishes the 0.95 confidence interval.

SOURCE: U.S. Department of Education, Center for Education Statistics, "New Teachers in the Job Market: 1985 Update," *OERI Bulletin*, 1987.

Supplemental note 2:6.–Recent College Graduates surveys: activities of recent bachelor's degree recipients

Information on the activities of recent bachelor's degree recipients was obtained from the responses to several different questions on the Recent College Graduates surveys. Each respondent was coded as having only one principal activity, and these were coded hierarchically in the following order. Individuals who indicated that they were employed full time during the reference week were counted as full-time employed, regardless of their other activities. For example, someone who was working full time and also enrolled in school was counted only as full-time employed.

Individuals who were not full-time employed were then screened for military service (1985 only). Those not in the military were then checked for whether they were enrolled in school. Those not in any of the preceding categories were checked for whether they were unemployed (that is, not working but looking for work and had made specific attempts to find work). Individuals not in any of the preceding categories were then checked to see if they were "not in the labor force," (that is, not working and not looking for work). Individuals not in any of these categories were classified as "other." This classification is composed primarily of people working part time.

The Center has conducted periodic surveys to collect information on outcomes of college graduation. The Recent College Graduates surveys have concentrated on graduates entering the teaching profession. To obtain accurate results on this subgroup, graduates who are newly qualified to teach have been oversampled in each of the surveys. These surveys are the source of data on employment of recent bachelor's degree recipients and of those who taught following graduation.

Each of the surveys used a two-stage sample procedure: the first stage was a stratified sample of institutions offering bachelor's and master's degrees, and the second stage was a sample of graduates from the sampled institutions. The institutions were stratified by percentage of education graduates, control, and geographic region. The institutions were selected with probabilities proportional to their size, based on the number of graduates and the percentage of education graduates.

The graduates within the sampled institutions were stratified by level of degree; by whether they were education graduates; and by whether they were special or vocational education graduates. Different probabilities of selection were assigned to each stratum to obtain the desired sample size of each type of graduate.

Response rates have tended to be low because of the great difficulty in tracing the students after graduation. Much of the nonresponse can be attributed to the ability to find valid mailing addresses rather than refusals to participate.

The 1981 survey covered 301 institutions and 15,852 students. Responses were obtained from 286 institutions for an institutional response rate of 95 percent. Responses were received from 9,312 graduates, resulting in a response rate of 62 percent. A total of 716 graduates were determined to be out-of-scope for the survey.

In the 1985 survey, the response rate for colleges was 98 percent. Data were requested from 18,738 students from 404 colleges. Responses were obtained from 13,200 students for a response rate of 74 percent, with 885 out-of-scope graduates.

Indicator 2:7

Table 2:7-1.—Research and development (R&D) expenditures at doctorate-granting institutions, by source of funds: Fiscal years 1972–1986

	R&D expenditures at doctorate-granting institutions[1]			Total national R&D expenditures as a percent of gross national product (GNP)	Source of funds at doctorate-granting institutions (percentage distribution)					
Year	Current dollars (in thousands)	Constant 1982 dollars[2] (in thousands)	As a percent of total national R&D expenditures		Total	Federal government	State/Local government	Industry	Institutional funds	Other
1972	$2,568,573	$5,523,813	9.1	2.3	100.0	68.3	10.2	2.8	11.6	7.1
1973	2,809,160	5,675,071	9.1	2.3	100.0	69.0	10.0	2.9	11.1	7.0
1974	2,953,658	5,469,737	9.1	2.2	100.0	67.4	10.0	3.2	12.3	7.2
1975	3,338,409	5,629,695	9.4	2.2	100.0	67.1	9.7	3.3	12.3	7.6
1976	3,656,868	5,795,385	9.5	2.2	100.0	67.4	9.7	3.3	11.9	7.6
1977	3,987,885	5,925,535	9.3	2.1	100.0	67.1	9.2	3.4	12.6	7.7
1978	4,540,256	6,298,443	9.4	2.1	100.0	66.2	8.9	3.7	13.4	7.8
1979	5,271,643	6,706,925	9.7	2.2	100.0	67.0	8.8	3.6	13.6	7.0
1980	5,958,867	6,953,170	9.6	2.3	100.0	67.6	8.1	3.9	13.7	6.7
1981	6,695,996	7,123,400	9.3	2.4	100.0	66.9	8.0	4.3	14.3	6.5
1982	7,147,677	7,147,677	9.0	2.5	100.0	65.4	8.3	4.6	14.9	6.8
1983	7,675,992	7,387,865	8.8	2.6	100.0	63.5	8.0	4.8	16.1	7.5
1984	8,367,143	7,768,935	8.6	2.6	100.0	63.2	8.0	5.4	16.0	7.4
1985	9,381,822	8,436,890	8.8	2.7	100.0	62.9	7.7	5.7	16.4	7.3
1986[3]	10,570,638	9,264,363	9.1	2.8	100.0	61.8	8.4	6.2	16.6	6.9

[1] R&D expenditures include separately budgeted expenditures for basic research and for applied research and development. They do not include expenditures by university-administered federally funded research and development centers (FFRDC's). R&D expenditures at doctorate-granting institutions made up 98.6 percent of total academic R&D expenditures in 1986.

[2] Based on GNP implicit price deflator; base year = 1982.

[3] Estimated.

NOTE: Detail may not add to totals due to rounding.

SOURCE: National Science Board, *Science Indicators: The 1985 Report*, 1985; National Science Foundation, *Early Release of Summary Statistics on Academic Science/Engineering Resources*, October 1987. (Based on Scientific and Engineering Expenditures at Universities and Colleges survey, various years.)

Indicator 2:8

Table 2:8-1.—Median earnings and earnings ratios of year-round, full-time workers 25–34 years old, by educational attainment and by race and sex: 1978–1987

		Earnings ratios*			Earnings ratios	
Year (March)	Median earnings: 4 years of high school	1–3 years college to 4 years high school	4 or more years college to 4 years high school	Median earnings: 4 years of high school	1–3 years college to 4 years high school	4 or more years college to 4 years high school
		White			Black	
1978	$11,825	1.07	1.20	$9,330	1.12	1.38
1979	12,351	1.09	1.24	10,410	1.15	1.27
1980	13,357	1.13	1.24	10,950	1.14	1.35
1981	14,563	1.09	1.24	12,001	1.08	1.29
1982	15,308	1.10	1.33	13,106	1.06	1.27
1983	15,754	1.14	1.32	13,083	1.12	1.34
1984	16,356	1.15	1.32	13,229	1.19	1.38
1985	17,597	1.14	1.30	13,337	1.14	1.50
1986	17,708	1.18	1.43	14,276	1.09	1.46
1987	18,238	1.16	1.41	14,357	1.12	1.49
		Men			Women	
1978	13,472	1.06	1.17	8,662	1.12	1.29
1979	15,048	1.02	1.12	9,195	1.09	1.29
1980	15,860	1.04	1.16	9,914	1.13	1.33
1981	16,752	1.05	1.21	11,001	1.12	1.35
1982	17,664	1.09	1.27	11,755	1.13	1.39
1983	18,137	1.12	1.28	12,475	1.16	1.37
1984	18,815	1.12	1.32	12,867	1.19	1.37
1985	20,399	1.10	1.26	13,571	1.15	1.43
1986	20,092	1.14	1.35	14,246	1.15	1.47
1987	20,540	1.14	1.35	14,424	1.17	1.52

*The earnings ratio is the earnings of those completing 1–3 or 4 or more years of college divided by the earnings of those completing only 4 years of high school.

SOURCE: U.S. Department of Commerce, Bureau of the Census, Current Population Survey, March of various years, unpublished tabulations.

Table 2:8-2.—Median earnings of year-round, full-time workers 25–34 years old, by educational attainment and by race and sex: 1978–1987

Year (March)	4 years of high school	1–3 years of college	4 or more years of college	4 years of high school	1–3 years of college	4 or more years of college
		White			Black	
1978	$11,825	$12,711	$14,221	$ 9,330	$10,430	$12,843
1979	12,351	13,431	15,298	10,410	11,922	13,192
1980	13,357	15,094	16,497	10,950	12,492	14,802
1981	14,563	15,851	18,111	12,001	12,940	15,471
1982	15,308	16,860	20,314	13,106	13,939	16,608
1983	15,754	17,916	20,864	13,083	14,696	17,568
1984	16,356	18,772	21,527	13,229	15,681	18,266
1985	17,597	20,051	22,945	13,337	15,168	19,968
1986	17,708	20,864	25,393	14,276	15,500	20,815
1987	18,238	21,224	25,795	14,357	16,133	21,395
		Men			Women	
1978	13,472	14,237	15,770	8,662	9,669	11,161
1979	15,048	15,358	16,861	9,195	10,048	11,880
1980	15,860	16,512	18,359	9,914	11,164	13,163
1981	16,752	17,618	20,320	11,001	12,357	14,874
1982	17,664	19,321	22,464	11,755	13,337	16,286
1983	18,137	20,307	23,253	12,475	14,419	17,087
1984	18,815	20,988	24,799	12,867	15,361	17,587
1985	20,399	22,371	25,720	13,571	15,609	19,351
1986	20,092	22,972	27,199	14,246	16,382	20,999
1987	20,540	23,469	27,693	14,424	16,946	21,883

SOURCE: U.S. Department of Commerce, Bureau of the Census, Current Population Survey, March of various years, unpublished tabulations.

Table 2:8-3.—Standard errors for median earnings and earnings ratios of year-round, full-time workers 25–34 years old, by educational attainment and by race and sex: 1978–1987 (table 2:8-1)

Year (March)	Median earnings: 4 years of high school	Earnings ratios		Median earnings: 4 years of high school	Earnings ratios	
		1–3 years college to 4 years high school	4 or more years college to 4 years high school		1–3 years college to 4 years high school	4 or more years college to 4 years high school
		White			Black	
1978	$128	0.02	0.02	$242	0.05	0.05
1979	132	.02	.02	315	.06	.07
1980	156	.02	.02	409	.05	.08
1981	173	.02	.02	341	.05	.06
1982	129	.02	.02	335	.04	.07
1983	140	.02	.02	424	.06	.06
1984	151	.02	.02	345	.04	.07
1985	193	.02	.02	297	.05	.06
1986	196	.02	.02	377	.04	.07
1987	203	.02	.02	467	.05	.07
		Men			Women	
1978	$137	0.02	0.02	$106	0.02	0.02
1979	134	.01	.02	129	.02	.03
1980	137	.01	.02	106	.02	.02
1981	163	.02	.02	117	.02	.03
1982	215	.02	.02	150	.02	.02
1983	241	.02	.02	133	.02	.02
1984	266	.02	.03	147	.02	.02
1985	175	.02	.01	170	.02	.03
1986	234	.02	.02	207	.02	.03
1987	202	.02	.02	222	.03	.03

SOURCE: U.S. Department of Commerce, Bureau of the Census, Current Population Survey, March of various years, unpublished tabulations.

Table 2:8-4.—Standard errors for median earnings of year-round, full-time workers 25–34 years old, by educational attainment and by race and sex: 1978–1987 (table 2:8-2)

Year (March)	4 years of high school	1–3 years of college	4 or more years of college	4 years of high school	1–3 years of college	4 or more years of college
		White			Black	
1978	$128	$135	$156	$242	$354	$373
1979	132	187	128	315	522	602
1980	156	154	157	409	337	739
1981	173	159	206	341	440	544
1982	129	203	164	335	396	754
1983	140	258	184	424	559	614
1984	151	277	217	345	383	754
1985	193	247	249	297	500	726
1986	196	224	166	377	414	769
1987	203	239	189	467	483	821
		Men			Women	
1978	137	197	129	106	145	154
1979	134	137	183	129	146	184
1980	137	189	234	106	191	176
1981	163	233	184	117	160	229
1982	215	338	261	150	188	204
1983	241	204	303	133	257	221
1984	266	246	327	147	190	232
1985	175	303	186	170	197	343
1986	234	353	235	207	240	246
1987	202	395	264	222	294	270

SOURCE: U.S. Department of Commerce, Bureau of the Census, Current Population Survey, March of various years, unpublished tabulations.

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Table 2:8-5.—Number of earners for median earnings of year-round, full-time workers 25–32 years old, by educational attainment and by race and sex: 1978–1987 (table 2:8-2)

(In thousands)

Year (March)	4 years of high school	1–3 years of college	4 or more years of college	4 years of high school	1–3 years of college	4 or more years of college
		White			Black	
1978	5,010	3,100	4,124	710	397	253
1979	5,367	3,396	4,390	733	394	293
1980	5,854	3,539	4,784	841	484	291
1981	6,185	3,657	4,866	798	529	305
1982	6,243	3,580	4,998	871	539	347
1983	5,765	3,510	5,173	843	491	403
1984	6,201	3,657	5,401	1,001	479	409
1985	6,955	4,153	5,366	1,022	579	438
1986	7,215	4,054	5,762	1,091	610	513
1987	7,328	4,069	5,824	1,154	655	450
		Men			Women	
1978	3,642	2,400	3,106	2,182	1,154	1,399
1979	3,785	2,634	3,269	2,399	1,230	1,553
1980	4,083	2,694	3,537	2,731	1,421	1,719
1981	4,274	2,682	3,539	2,831	1,611	1,843
1982	4,370	2,555	3,524	2,890	1,682	2,022
1983	3,875	2,464	3,601	2,858	1,635	2,206
1984	4,304	2,490	3,567	3,025	1,764	2,492
1985	4,824	2,860	3,626	3,312	2,015	2,444
1986	5,092	2,825	3,888	3,388	1,976	2,629
1987	5,215	2,817	3,850	3,428	2,093	2,720

SOURCE: U.S. Department of Commerce, Bureau of the Census, Current Population Survey, March of various years, unpublished tabulations.

Table 2:9-1.—Total degrees and percent earned by foreign students, by field of study and degree level: Selected academic years ending 1977–1985

Degree level and field of study	1977		1979		1981		1985	
	Total degrees	Percent earned by foreign students[1]	Total degrees	Percent earned by foreign students[1]	Total degrees	Percent earned by foreign students[1]	Total degrees	Percent earned by foreign students[1]
				Bachelor's degrees				
All fields	915,131	1.7	916,347	1.9	934,800	2.4	968,311	3.0
Natural sciences and engineering[2]	144,707	4.0	153,514	4.6	168,318	5.8	209,704	5.7
Life and physical sciences and mathematics	89,789	2.1	83,395	2.3	78,244	2.7	76,555	3.2
Computer and information sciences	6,370	4.2	8,693	4.3	15,120	5.1	38,589	5.5
Engineering[3]	48,548	7.4	61,426	7.7	74,954	9.3	94,560	7.8
Other fields	770,424	1.3	762,833	1.4	766,482	1.7	758,607	2.3
				Master's degrees				
All fields	315,660	5.5	299,887	6.5	294,183	7.5	280,421	9.6
Natural sciences and engineering[2]	34,684	15.6	33,489	18.1	34,271	20.7	41,193	23.7
Life and physical sciences and mathematics	16,091	9.3	15,270	10.8	13,770	11.8	13,516	16.7
Computer and information sciences	2,724	13.4	2,980	15.6	4,143	21.8	6,942	24.6
Engineering[3]	15,869	22.3	15,239	25.9	16,358	27.9	20,735	28.0
Other fields	280,976	4.2	266,398	5.0	259,912	5.8	239,228	7.2

Table 2:9-1.—Total degrees and percent earned by foreign students, by field of study and degree level: Selected academic years ending 1977–1985—Continued

Degree level and field of study	1977		1979		1981		1985	
	Total degrees	Percent earned by foreign students[1]	Total degrees	Percent earned by foreign students[1]	Total degrees	Percent earned by foreign students[1]	Total degrees	Percent earned by foreign students[1]
				Doctor's degrees				
All fields	33,111	11.3	32,664	12.0	32,839	12.8	32,307	16.5
Natural sciences and engineering[2]	10,349	18.6	10,101	18.9	10,389	19.3	10,836	25.6
Life and physical sciences and mathematics	7,559	13.7	7,374	13.5	7,586	13.1	7,422	17.6
Computer and information sciences	216	20.8	236	20.3	252	20.6	240	29.2
Engineering[3]	2,574	32.9	2,491	34.8	2,551	37.5	3,174	44.0
Other fields	22,762	8.0	22,563	8.9	22,450	9.8	21,471	11.8

[1] Nonresident aliens, i.e., non-United States citizens on temporary visas.

[2] Life and physical sciences, mathematics, computer and information sciences, and engineering.

[3] Includes engineering technologies.

NOTE: The total number of degrees reported in this table for each degree level and field of study is lower, but by no more than 2 percent, than the total actually conferred. This is because racial/ethnic/ citizenship status data were not imputed for some of the institutions that did not report such data.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics*, 1980, 1982, 1987, and 1988 editions. (Based on: U.S. Department of Education, Office of Civil Rights, *Data on Earned Degrees Conferred by Institutions of Higher Education, by Race, Ethnicity, and Sex, Academic Years 1976–77 and 1978–79*; and National Center for Education Statistics, the HEGIS survey Degrees and Other Formal Awards Conferred 1980–81 and 1984–85.)

Table 2:9-2.—Postgraduation plans of foreign doctorate recipients with temporary U.S. visas, by major field: Academic years ending 1976–1986

Year of doctorate	Number of recipients[1]	Percent of recipients			
			With definite plans in the United States		
		With definite plans	Total[2]	Employment plans	Postdoctoral study plans
		Natural sciences and engineering[3]			
1976	2,080	61.3	26.4	10.4	15.8
1977	2,024	60.9	28.0	11.8	15.9
1978	1,973	63.8	31.5	12.4	19.1
1979	2,044	67.7	33.0	14.7	18.1
1980	2,131	67.5	34.2	15.8	18.1
1981	2,308	64.8	33.2	18.2	14.8
1982	2,471	65.1	32.7	17.9	14.6
1983	2,725	64.4	31.0	16.0	15.0
1984	2,935	61.5	33.3	15.6	17.6
1985	3,264	62.3	33.2	15.3	17.7
1986	3,338	64.7	37.1	15.5	21.5
		All other fields			
1976	1,449	66.5	12.7	10.5	2.1
1977	1,424	66.1	12.2	10.3	1.5
1978	1,448	69.5	14.4	12.6	1.7
1979	1,543	67.3	13.1	11.0	1.9
1980	1,512	66.7	11.8	8.9	2.8
1981	1,632	68.3	13.8	10.8	2.8
1982	1,733	65.6	12.0	9.6	2.4
1983	1,774	63.7	13.0	10.8	2.3
1984	1,892	61.9	12.7	10.1	2.5
1985	1,965	63.9	15.7	13.1	2.5
1986	1,929	65.3	18.4	15.0	3.2

[1] Due to differences in survey design, the total number of doctorates received by non-U.S citizens with temporary visas obtained by the National Science Foundation's survey is smaller than that obtained by the U.S. Department of Education's survey (see table 2:9-1). The Department's survey refers to these doctorate recipients as nonresident aliens.

[2] Includes a small proportion (less than 1 percent) whose plans are unknown.

[3] Physical and life sciences, mathematics, computer and information sciences, and engineering.

SOURCE: National Science Foundation, Survey of Earned Doctorates, various years, unpublished tabulations.

Table 2:10-1.—Degrees earned, by race/ethnicity and degree level: Selected academic years ending 1977–1985

Race/ethnicity	1977	1979	1981	1985
		Bachelor's degrees		
Total	915,131	916,347	934,800	968,311
White, non-Hispanic	805,186	799,617	807,319	826,106
Black, non-Hispanic	58,515	60,130	60,673	57,473
Hispanic	18,663	20,029	21,832	25,874
Asian or Pacific Islander	13,745	15,336	18,794	25,395
American Indian/Alaskan Native	3,319	3,404	3,593	4,246
Nonresident alien	15,703	17,831	22,589	29,217
		Master's degrees		
Total	315,660	299,887	294,183	280,421
White, non-Hispanic	265,147	249,051	241,216	223,628
Black, non-Hispanic	21,024	19,393	17,133	13,939
Hispanic	6,069	5,544	6,461	6,864
Asian or Pacific Islander	5,115	5,495	6,282	7,782
American Indian/Alaskan Native	967	999	1,034	1,256
Nonresident alien	17,338	19,405	22,057	26,952
		Doctor's degrees		
Total	33,111	32,664	32,839	32,307
White, non-Hispanic	26,836	26,128	25,908	23,934
Black, non-Hispanic	1,253	1,267	1,265	1,154
Hispanic	522	439	456	677
Asian or Pacific Islander	658	811	877	1,106
American Indian/Alaskan Native	95	104	130	119
Nonresident alien	3,747	3,915	4,203	5,317
		First-professional degrees		
Total	63,953	68,611	71,340	71,057
White, non-Hispanic	58,422	62,430	64,551	63,219
Black, non-Hispanic	2,537	2,836	2,931	3,029
Hispanic	1,076	1,283	1,541	1,884
Asian or Pacific Islander	1,021	1,205	1,456	1,816
American Indian/Alaskan Native	196	216	192	248
Nonresident alien	701	641	669	861

NOTE: Data for academic year ending 1983 were not fully edited and thus are not available for publication. The total number of degrees reported in this table is lower than the total actually conferred (6 percent lower for first-professional degrees and 2 percent or less lower for other degree types). This is because racial/ethnic data were not imputed for some of the institutions that did not report such data.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics*, 1980, 1982, 1987, and 1988 editions (based on the HEGIS survey Earned Degrees Conferred, various years).

Table 2:10-2.—Associate degrees earned, by race/ethnicity: Academic year ending 1985

Race/ethnicity	Number of degrees
Total	429,823
White, non-Hispanic	355,343
Black, non-Hispanic	35,799
Hispanic	19,407
American Indian/Alaskan Native	2,953
Asian or Pacific Islander	9,914
Nonresident alien	6,407

NOTE: The total number of associate degrees reported here is 6 percent lower than the total number actually conferred. This is because racial/ethnic data were not imputed for some of the institutions not reporting such data.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1988* (based on the HEGIS survey Earned Degrees Conferred, various years).

Table 2:10-3.—Degrees earned by black, non-Hispanic men and women, by level of degree: Selected academic years ending 1977–1985

Sex and degree level	1977	1979	1981	1985
Men				
Bachelor's	25,026	24,544	24,511	23,018
Master's	7,769	7,045	6,158	5,200
Doctor's	766	733	694	561
First-professional	1,761	1,783	1,772	1,623
Women				
Bachelor's	33,489	35,586	36,162	34,455
Master's	13,255	12,348	10,975	8,739
Doctor's	487	534	571	593
First-professional	776	1,053	1,159	1,406

NOTE: Data for academic year ending 1983 were not fully edited and thus are not available for publication.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics*, 1980, 1982, 1987, and 1988 editions (based on the HEGIS survey Earned Degrees Conferred, various years).

Table 2:11-1.—Percentage distribution of field of study, by degree level and race/ethnicity: Academic years ending 1977 and 1985

Degree level and field of study	1977						
	Total	White (non-Hispanic)	Black (non-Hispanic)	Hispanic	American Indian/ Alaskan Native	Asian or Pacific Islander	Non-resident alien
				Bachelor's degrees			
Number	915,131	805,186	58,515	18,663	3,319	13,745	15,703
Total percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Arts and sciences	43.6	43.7	40.8	49.8	42.0	46.8	36.8
Sciences	27.7	27.5	29.6	30.9	26.8	32.3	25.2
Physical and biological sciences	9.8	10.0	6.5	8.2	7.5	14.5	12.2
Social sciences	17.9	17.5	23.1	22.6	19.3	17.8	13.1
Humanities	15.8	16.2	11.2	19.0	15.2	14.5	11.5
Professional/technical	56.4	56.3	59.2	50.2	58.0	53.2	63.2
Business and management	16.6	16.5	17.0	13.9	13.0	18.9	21.1
Education	15.7	15.5	22.1	16.3	21.3	6.5	4.7
Computer and information sciences	0.7	0.7	0.6	0.5	0.5	1.2	1.7
Engineering	5.3	5.1	2.3	4.8	4.0	8.7	22.7
Other professional/ technical	18.2	18.5	17.1	14.7	19.2	17.9	13.0
				Advanced degrees*			
Number	348,771	291,983	22,277	6,591	1,082	5,773	21,085
Total percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Arts and sciences	25.8	26.1	15.4	27.7	21.8	28.4	30.7
Sciences	15.5	15.3	10.0	15.5	14.1	18.7	22.4
Physical and biological sciences	6.8	6.7	2.4	3.9	6.8	10.6	12.0
Social sciences	8.7	8.6	7.6	11.6	7.3	8.1	10.3
Humanities	10.3	10.8	5.4	12.2	7.6	9.7	8.3
Professional/technical	74.2	73.9	84.6	72.3	78.2	71.6	69.3
Business and management	13.5	13.6	7.3	8.8	10.3	16.5	18.7
Education	38.5	39.0	60.1	43.0	48.6	18.5	13.1
Computer and information sciences	0.8	0.8	0.3	0.7	0.4	2.0	1.9
Engineering	5.3	4.3	1.2	4.1	2.4	14.9	20.8
Other professional/ technical	16.1	16.2	15.7	15.7	16.7	19.7	14.7

Table 2:11-1.—Percentage distribution of field of study, by degree level and race/ethnicity: Academic years ending 1977 and 1985—Continued

Degree level and field of study	1977 Total	White (non-Hispanic)	Black (non-Hispanic)	Hispanic	American Indian/ Alaskan Native	Asian or Pacific Islander	Non-resident alien
				Master's degrees			
Number	315,660	265,147	21,024	6,069	967	5,115	17,338
Total percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Arts and sciences	22.4	22.7	14.1	25.3	18.6	24.9	26.4
Sciences	12.6	12.5	9.1	13.5	11.4	14.9	18.2
Physical and biological sciences	5.1	5.1	2.1	2.8	5.0	7.7	8.7
Social sciences	7.5	7.4	7.0	10.7	6.4	7.2	9.5
Humanities	9.8	10.2	5.0	11.8	7.2	10.0	8.2
Professional/technical	77.6	77.3	85.9	74.7	81.4	75.1	73.6
Business and management	14.6	14.8	7.7	9.4	11.0	18.3	21.8
Education	40.0	40.4	60.4	43.9	50.1	19.4	13.8
Computer and information sciences	0.9	0.8	0.3	0.8	0.3	2.1	2.1
Engineering	5.0	4.2	1.1	4.0	2.4	14.3	20.4
Other professional/ technical	17.1	17.2	16.3	16.5	17.7	21.0	15.5
				Doctor's degrees			
Number	33,111	26,836	1,253	522	95	658	3,747
Total percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Arts and sciences	58.0	60.1	37.0	55.7	53.7	55.8	50.5
Sciences	42.6	43.4	26.3	38.9	42.1	48.5	41.8
Physical and biological sciences	22.8	22.7	8.5	16.5	25.3	33.6	27.6
Social sciences	19.8	20.7	17.7	22.4	16.8	14.9	14.2
Humanities	15.4	16.7	10.8	16.9	11.6	7.3	8.7
Professional/technical	42.0	39.9	63.0	44.3	46.3	44.2	49.5
Business and management	2.6	2.5	1.0	1.3	3.2	2.4	4.3
Education	24.0	24.7	54.7	31.4	33.7	11.7	10.2
Computer and information sciences	0.7	0.6	0.1	.0	1.1	1.4	1.2
Engineering	7.8	5.8	1.8	4.8	2.1	18.8	22.6
Other professional/ technical	7.0	6.4	5.3	6.7	6.3	9.9	11.3

Table 2:11-1.—Percentage distribution of field of study, by degree level and race/ethnicity: Academic years ending 1977 and 1985—Continued

Degree level and field of study	1985 Total	White (non-Hispanic)	Black (non-Hispanic)	Hispanic	American Indian/ Alaskan Native	Asian or Pacific Islander	Non-resident alien
				Bachelor's degrees			
Number	968,311	826,106	57,473	25,874	4,246	25,395	29,217
Total percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Arts and sciences	34.7	35.0	32.9	38.5	37.2	36.3	27.0
Sciences	21.4	21.3	21.6	23.5	22.8	25.4	18.0
Physical and biological sciences	7.9	7.8	6.3	7.4	7.5	14.1	8.4
Social sciences	13.5	13.4	15.3	16.1	15.3	11.3	9.6
Humanities	13.4	13.7	11.3	15.0	14.4	10.8	9.1
Professional/technical	65.3	65.0	67.1	61.5	62.8	63.7	73.0
Business and management	23.9	23.8	26.1	22.3	21.7	20.8	25.4
Education	9.1	9.4	9.5	9.8	11.4	3.0	3.5
Computer and information sciences	4.0	3.8	3.7	3.2	3.3	8.0	7.2
Engineering	9.8	9.3	5.5	8.7	7.4	19.7	25.4
Other professional/ technical	18.6	18.8	22.3	17.5	19.1	12.1	11.5
				Advanced degrees*			
Number	312,728	247,562	15,093	7,541	1,375	8,888	32,269
Total percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Arts and sciences	23.9	24.0	15.0	24.2	19.4	24.0	28.0
Sciences	14.5	14.0	9.7	14.2	11.4	16.6	19.8
Physical and biological sciences	6.7	6.3	2.6	5.3	4.5	10.1	11.1
Social sciences	7.8	7.7	7.1	9.0	6.9	6.5	8.7
Humanities	9.5	10.0	5.3	10.0	8.0	7.4	8.2
Professional/technical	76.1	76.0	85.0	75.8	80.6	76.0	72.0
Business and management	21.6	22.3	17.3	15.6	20.0	23.7	18.7
Education	26.5	27.8	42.0	35.6	37.7	10.0	10.9
Computer and information sciences	2.3	1.8	1.2	1.3	3.1	7.1	5.5
Engineering	7.6	5.6	2.7	5.7	4.1	20.7	22.3
Other professional/ technical	18.1	18.4	21.9	17.7	15.7	14.6	14.6

Table 2:11-1.—Percentage distribution of field of study, by degree level and race/ethnicity: Academic years ending 1977 and 1985—Continued

Degree level and field of study	1985						
	Total	White (non-Hispanic)	Black (non-Hispanic)	Hispanic	American Indian/ Alaskan Native	Asian or Pacific Islander	Non-resident alien
				Master's degrees			
Number	280,421	223,628	13,939	6,864	1,256	7,782	26,952
Total percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Arts and sciences	20.5	20.5	13.1	21.3	17.8	20.1	24.5
Sciences	11.5	11.0	8.2	11.8	10.0	13.0	16.3
Physical and biological sciences	4.8	4.5	2.1	3.9	3.7	7.1	8.4
Social sciences	6.6	6.5	6.1	7.9	6.4	5.9	7.9
Humanities	9.0	9.4	4.9	9.5	7.8	7.1	8.3
Professional/technical	79.5	79.5	86.9	78.7	82.2	79.9	75.5
Business and management	23.7	24.4	18.7	17.1	21.6	26.6	21.6
Education	27.0	28.3	41.7	36.7	37.3	10.3	10.8
Computer and information sciences	2.5	1.9	1.3	1.4	3.3	7.9	6.3
Engineering	7.4	5.6	2.6	5.0	3.9	20.2	21.6
Other professional/ technical	18.9	19.2	22.7	18.6	16.2	14.9	15.1

Table 2:11-1.—Percentage distribution of field of study, by degree level and race/ethnicity: Academic years ending 1977 and 1985—Continued

Degree level and field of study	1985 Total	 White (non-Hispanic)	 Black (non-Hispanic)	 Hispanic	 American Indian/ Alaskan Native	 Asian or Pacific Islander	 Non-resident alien
				Doctor's degrees			
Number	32,307	23,934	1,154	677	119	1,106	5,317
Total percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Arts and sciences	53.9	56.8	37.9	53.6	36.1	51.9	45.4
Sciences	40.6	42.0	27.7	38.8	26.1	41.8	37.6
Physical and biological sciences	23.0	23.1	8.2	19.5	13.4	31.1	24.6
Social sciences	17.6	18.9	19.5	19.4	12.6	10.7	13.0
Humanities	13.3	14.8	10.1	14.8	10.1	10.1	7.8
Professional/technical	46.1	43.2	62.1	46.4	63.9	48.1	54.6
Business and management	2.6	2.5	1.2	0.6	3.4	3.2	3.8
Education	21.8	23.5	45.1	24.1	42.9	7.6	11.2
Computer and information sciences	0.7	0.6	0.3	0.3	0.8	1.3	1.3
Engineering	9.8	5.8	3.5	13.1	5.9	23.8	26.3
Other professional/ technical	11.1	10.9	12.0	8.3	10.9	12.3	12.0

[1] Advanced degrees include master's and doctor's degrees.

NOTE: The total number of degrees reported in this table for each degree level and field of study is lower, but by no more than 2 percent, than the total number of degrees conferred. This is because racial/ethnic data were not imputed for some of the institutions that did not report such data.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics*, 1980 and 1988 editions (based on the HEGIS survey Earned Degrees Conferred, various years).

Table 2:11-2.—Number of degrees earned, by field of study, degree level, and race/ethnicity: Academic years ending 1977 and 1985

Degree level and field of study	1977 Total	White (non-Hispanic)	Black (non-Hispanic)	Hispanic	American Indian/ Alaskan Native	Asian or Pacific Islander	Non-resident alien
				Bachelor's degrees			
Total	915,131	805,186	58,515	18,663	3,319	13,745	15,703
Arts and sciences	398,600	351,803	23,892	9,298	1,393	6,438	5,776
Sciences	253,860	221,476	17,325	5,761	889	4,445	3,964
Physical and biological sciences	89,789	80,313	3,785	1,534	250	1,996	1,911
Social sciences	164,071	141,163	13,540	4,227	639	2,449	2,053
Humanities	144,740	130,327	6,567	3,537	504	1,993	1,812
Professional/technical	516,531	453,383	34,623	9,365	1,926	7,307	9,927
Business and management	151,723	132,814	9,976	2,588	433	2,596	3,316
Education	143,462	125,148	12,922	3,050	707	894	741
Computer and information sciences	6,370	5,473	361	93	15	163	265
Engineering	48,548	41,391	1,368	887	134	1,199	3,569
Other professional/ technical	166,428	148,557	9,996	2,747	637	2,455	2,036
				Advanced degrees*			
Total	348,771	291,983	22,277	6,591	1,062	5,773	21,085
Arts and sciences	89,835	76,235	3,431	1,828	231	1,640	6,470
Sciences	53,954	44,750	2,236	1,023	150	1,080	4,715
Physical and biological sciences	23,650	19,631	539	257	72	614	2,537
Social sciences	30,304	25,119	1,697	766	78	466	2,178
Humanities	35,881	31,485	1,195	805	81	560	1,755
Professional/technical	258,936	215,748	18,846	4,763	831	4,133	14,615
Business and management	47,025	39,808	1,634	579	109	953	3,942
Education	134,310	113,743	13,381	2,831	516	1,067	2,772
Computer and information sciences	2,940	2,296	67	46	4	116	411
Engineering	18,443	12,642	260	270	25	858	4,388
Other professional/ technical	56,218	47,259	3,504	1,037	177	1,139	3,102

Table 2:11-2.—Number of degrees earned, by field of study, degree level, and race/ethnicity: Academic years ending 1977 and 1985—Continued

	1977						
Degree level and field of study	Total	White (non-Hispanic)	Black (non-Hispanic)	Hispanic	American Indian/ Alaskan Native	Asian or Pacific Islander	Non-resident alien
	Master's degrees						
Total	315,660	265,147	21,024	6,069	967	5,115	17,338
Arts and sciences	70,642	60,106	2,967	1,537	180	1,273	4,579
Sciences	39,850	33,102	1,907	820	110	761	3,150
Physical and biological sciences	16,091	13,544	432	171	48	393	1,503
Social sciences	23,759	19,558	1,475	649	62	368	1,647
Humanities	30,792	27,004	1,060	717	70	512	1,429
Professional/technical	245,018	205,041	18,057	4,532	787	3,842	12,759
Business and management	46,157	39,140	1,621	572	106	937	3,781
Education	126,355	107,127	12,696	2,667	484	990	2,391
Computer and information sciences	2,724	2,136	66	46	3	107	366
Engineering	15,869	11,089	237	245	23	734	3,541
Other professional/ technical	53,913	45,549	3,437	1,002	171	1,074	2,680
	Doctor's degrees						
Total	33,111	26,836	1,253	522	95	658	3,747
Arts and sciences	19,193	16,129	464	291	51	367	1,891
Sciences	14,104	11,648	329	203	40	319	1,565
Physical and biological sciences	7,559	6,087	107	86	24	221	1,034
Social sciences	6,545	5,561	222	117	16	98	531
Humanities	5,089	4,481	135	88	11	48	326
Professional/technical	13,918	10,707	789	231	44	291	1,856
Business and management	868	668	13	7	3	16	161
Education	7,955	6,616	685	164	32	77	381
Computer and information sciences	216	160	1	0	1	9	45
Engineering	2,574	1,553	23	25	2	124	847
Other professional/ technical	2,305	1,710	67	35	6	65	422

Table 2:11-2.—Number of degrees earned, by field of study, degree level, and race/ethnicity: Academic years ending 1977 and 1985—Continued

Degree level and field of study	1985						
	Total	White (non-Hispanic)	Black (non-Hispanic)	Hispanic	American Indian/ Alaskan Native	Asian or Pacific Islander	Non-resident alien
				Bachelor's degrees			
Total	968,311	826,106	57,473	25,874	4,246	25,395	29,217
Arts and sciences	336,349	228,781	18,912	9,964	1,578	9,211	7,903
Sciences	206,873	175,697	12,407	6,092	966	6,457	5,254
Physical and biological sciences	76,555	64,629	3,640	1,915	318	3,593	2,460
Social sciences	130,318	111,068	8,767	4,177	648	2,864	2,794
Humanities	129,476	113,084	6,505	3,872	612	2,754	2,649
Professional/technical	631,962	537,325	38,561	15,910	2,668	16,184	21,314
Business and management	231,308	196,915	14,999	5,771	921	5,274	7,428
Education	87,788	77,531	5,456	2,533	483	770	1,015
Computer and information sciences	38,589	31,321	2,143	826	139	2,044	2,116
Engineering	94,560	76,438	3,159	2,242	313	5,013	7,395
Other professional/ technical	179,717	155,120	12,804	4,538	812	3,083	3,360
				Advanced degrees*			
Total	312,728	247,562	15,093	7,541	1,375	8,888	32,269
Arts and sciences	74,875	59,356	2,264	1,824	267	2,136	9,028
Sciences	45,232	34,689	1,461	1,073	157	1,475	6,377
Physical and biological sciences	20,938	15,625	388	397	62	900	3,566
Social sciences	24,294	19,064	1,073	676	95	575	2,811
Humanities	29,643	24,667	803	751	110	661	2,651
Professional/technical	237,853	188,206	12,829	5,717	1,108	6,752	23,241
Business and management	67,445	55,252	2,615	1,179	275	2,105	6,019
Education	82,853	68,917	6,333	2,682	519	885	3,517
Computer and information sciences	7,182	4,453	183	96	42	629	1,779
Engineering	23,909	13,977	400	429	56	1,836	7,211
Other professional/ technical	56,464	45,607	3,298	1,331	216	1,297	4,715

Table 2:11-2.—Number of degrees earned, by field of study, degree level, and race/ethnicity: Academic years ending 1977 and 1985—Continued

Degree level and field of study	1985						
	Total	White (non-Hispanic)	Black (non-Hispanic)	Hispanic	American Indian/ Alaskan Native	Asian or Pacific Islander	Non-resident alien
	Master's degrees						
Total	280,421	223,628	13,939	6,864	1,256	7,782	26,952
Arts and sciences	57,451	45,761	1,827	1,461	224	1,562	6,616
Sciences	32,118	24,648	1,141	810	126	1,013	4,380
Physical and biological sciences	13,516	10,097	293	265	46	556	2,259
Social sciences	18,602	14,551	848	545	80	457	2,121
Humanities	25,333	21,113	686	651	98	549	2,236
Professional/technical	222,970	177,867	12,112	5,403	1,032	6,220	20,336
Business and management	66,596	54,663	2,601	1,175	271	2,070	5,816
Education	75,821	63,302	5,812	2,519	468	801	2,919
Computer and information sciences	6,942	4,303	180	94	41	615	1,709
Engineering	20,735	12,600	360	340	49	1,573	5,813
Other professional/ technical	52,876	42,999	3,159	1,275	203	1,161	4,079

Table 2:11-2.—Number of degrees earned, by field of study, degree level, and race/ethnicity: Academic years ending 1977 and 1985—Continued

Degree level and field of study	1985						
	Total	White (non-Hispanic)	Black (non-Hispanic)	Hispanic	American Indian/ Alaskan Native	Asian or Pacific Islander	Non-resident alien
	Doctor's degrees						
Total	32,307	23,934	1,154	677	119	1,106	5,317
Arts and sciences	17,424	13,595	437	363	43	574	2,412
Sciences	13,114	10,041	320	263	31	462	1,997
Physical and biological sciences	7,422	5,528	95	132	16	344	1,307
Social sciences	5,692	4,513	225	131	15	118	690
Humanities	4,310	3,554	117	100	12	112	415
Professional/technical	14,883	10,339	717	314	76	532	2,905
Business and management	849	589	14	4	4	35	203
Education	7,032	5,615	521	163	51	84	598
Computer and information sciences	240	150	3	2	1	14	70
Engineering	3,174	1,377	40	89	7	263	1,398
Other professional/ technical	3,588	2,608	139	56	13	136	636

*Advanced degrees include master's and doctor's degrees.

NOTE: The total number of degrees reported in this table for each degree level and field of study is lower, but by no more than 2 percent, than the total number of degrees conferred. This is because racial/ethnic data were not imputed for some of the institutions that did not report such data.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics*, 1980 and 1988 editions (based on the HEGIS survey Earned Degrees Conferred, various years).

Table 2:12-1.—Average scale scores of white, non-Hispanic young adults aged 21 to 25 on the prose, document, and quantitative literacy scales, by educational attainment and enrollment status: 1985

	Educational attainment and enrollment status				
Scale	High school graduate, not enrolled	Less than 2 years college, not enrolled	2 or more years college, not enrolled	2 or more years college, enrolled	College graduate
	Average scale score				
Prose	297.9	310.5	330.5	341.7	346.7
Document	301.1	316.0	332.9	346.1	351.6
Quantitative	298.4	315.6	327.0	344.2	348.6

SOURCE: U.S. Department of Education, Center for Education Statistics, "Young Adult Literacy and Schooling," Monograph, forthcoming.

Table 2:12-2.—Percent of white, non-Hispanic young adults aged 21 to 25 at or above scale levels on the prose, document, and quantitative literacy scales, by educational attainment and enrollment status: 1985

Scale and scale level*	Educational attainment and enrollment status: High school graduate, not enrolled	Less than 2 years college, not enrolled	2 or more years college, not enrolled	2 or more years college, enrolled	College graduate
	Percent at or above scale level				
Prose					
350	11.5	18.6	29.7	44.1	47.3
300	50.7	60.9	81.1	83.2	85.9
250	87.4	91.7	96.9	97.7	98.3
200	98.3	98.2	99.9	100.0	100.0
150	99.9	99.4	100.0	100.0	100.0
Document					
350	10.5	19.1	35.7	48.8	52.4
300	53.3	67.9	79.1	87.1	88.6
250	87.6	92.0	95.8	98.9	99.3
200	98.8	99.4	99.9	100.0	99.9
150	99.9	100.0	100.0	100.0	100.0
Quantitative					
350	11.5	19.5	31.6	46.6	48.4
300	51.4	64.7	73.0	85.2	88.0
250	85.0	96.3	94.7	97.9	99.1
200	98.2	99.7	100.0	100.0	100.0
150	99.9	100.0	100.0	100.0	100.0

*Scale level refers to the point on the scale at which individuals with that level of proficiency have an 80 percent probability of correctly responding to tasks at that level.

SOURCE: U.S. Department of Education, Center for Educations Statistics, "Young Adult Literacy and Schooling," *Monograph,* forthcoming.

Table 2:12-3.—Standard errors (and sample sizes) for average scale scores of white, non-Hispanic young adults aged 21 to 25 on the prose, document, and quantitative literacy scales, by educational attainment and enrollment status: 1985 (table 2:12-1)

	Educational attainment and enrollment status				
Scale	High school graduate, not enrolled	Less than 2 years college, not enrolled	2 or more years college, not enrolled	2 or more years college, enrolled	College graduate
Sample size	(524)	(172)	(161)	(254)	(322)
Prose	3.0	5.7	5.0	4.3	3.9
Document	2.9	5.2	5.4	4.0	3.7
Quantitative	3.2	4.7	5.7	4.4	3.7

SOURCE: U.S. Department of Education, National Center for Education Statistics, "Young Adult Literacy and Schooling," *Monograph*, forthcoming.

Table 2:12-4.—Standard errors (and sample sizes) for percent of white, non-Hispanic young adults aged 21 to 25 at or above scale levels on the prose, document, and quantitative literacy scales, by educational attainment and enrollment status: 1985 (table 2:12-2)

Scale and scale level	High school graduate, not enrolled	Less than 2 years college, not enrolled	2 or more years college, not enrolled	2 or more years college, enrolled	College graduate
	Educational attainment and enrollment status				
Sample size	(524)	(172)	(161)	(254)	(322)
Prose					
350	2.2	4.7	5.8	5.0	4.5
300	3.5	6.0	4.9	3.8	3.1
250	2.3	3.3	2.2	1.5	1.2
200	.9	1.6	.3	.0	.0
150	.2	1.0	.0	.0	.0
Document					
350	2.1	4.8	6.0	5.0	4.5
300	3.5	5.7	5.1	3.4	2.8
250	2.3	3.3	2.5	1.0	.7
200	.8	.9	.5	.0	.2
150	.3	.0	.0	.0	.0
Quantitative					
350	2.2	4.8	5.9	5.0	4.5
300	3.5	5.8	5.6	3.6	2.9
250	2.5	2.3	2.8	1.4	.9
200	.9	.6	.3	.0	.0
150	.2	.0	.0	.0	.0

SOURCE: U.S. Department of Education, National Center for Education Statistics, "Young Adult Literacy and Schooling," *Monograph*, forthcoming.

Supplemental note 2:12.–Literacy among college students and graduates

This examination of the relationship between literacy skills and schooling is based on the Young Adult Literacy Survey conducted by the National Assessment of Educational Progress (NAEP) from April through September 1985. Rather than a single measure or specific point on a scale that separates the "literate" from the "illiterate," the NAEP approach to literacy provides a means for understanding the various types and levels of literacy skills that, once acquired, allow an individual successfully to use a broad range of materials for different purposes. The definition of literacy adopted for the NAEP assessment was: *Using printed and written information to function in society, to achieve one's goals, and to develop one's knowledge and potential.*

The survey population included young adults between the ages of 21 and 25 inclusive who resided in private households. NAEP sampled black and Hispanic young adults at approximately double the rate of the remainder of the population. A total of 3,618 assessments were conducted. Based on their performance on an initial screening test, about 2 percent of the young adult population were estimated by the survey administrators to have such limited literacy skills that the exercises would unduly frustrate or embarrass them. About half of this group (or roughly 1 percent of the total) reported being unable to speak English. This analysis is based on the 3,474 respondents who took the assessment (98 percent of the sample).

The Young Adult Literacy Survey gathered information on literacy skills by administering simulation tasks designed so that no respondent was given the entire pool of exercises. Item response theory (IRT) methods were used to estimate proficiency on three scales representing distinct aspects of literacy: prose, document, and quantitative, plus the NAEP reading scale.

The theoretical range of the scores on all four scales is 0 to 500. The means for the prose, document, and quantitative scales were set equal to total group performance on the NAEP reading scale, which was derived from the 1983–84 NAEP reading assessment of 9-, 13-, and 17-year-old students. The total group mean for the young adults on each of the scales is 305.

To facilitate interpretation of the scale scores, examples were chosen of items characteristic of the underlying difficulty at various points on each of the three scales. The criterion for selecting examples of tasks at each level was that 80 percent or more of the respondents with a given scale score (e.g., 250) could perform the task correctly. However, not all individuals with a given scale score answered an item at that level correctly. Thus, in describing the analysis presented here, statements such as "at this scale level, three-quarters of young adults were able to" more precisely mean "at this scale level, three-quarters of young adults had at least an 80 percent probability of being able to . . . ."

Descriptions of the type and complexity of tasks measured by the three literacy scales are:

Prose comprehension—the knowledge and skills needed to understand and use information from texts that include editorials, news stories, poems, and the like. Three qualitatively different aspects of reading comprehension are identified as important for successful performance on the prose scale. One is matching information from a question to identical or corresponding information in text. Another is producing or interpreting text information. The third is generating a theme or organizing principle from text. Examples of the simplest tasks are: requiring the respondent to match information in a question with information in a newspaper article on the basis of a single, commonly shared feature; and writing a brief description of a job that he or she would like to have. The most difficult tasks include matching on the basis of three categories of information that are not identically phrased in the question and a newspaper article and extracting a theme from an unfamiliar poem.

Document literacy—the knowledge and skills required to locate and use information contained in job applications or payroll forms, bus schedules, maps, tables, indexes, and so forth. Difficulty of the tasks on the document scale is associated with increases in the number of features or categories of information the reader has to locate, the number of categories of information in the document that can serve as distractors (or plausible right answers), and the degree to which information given in the question or directive corresponds to the requested information in the document. Included in the easiest tasks are locating the expiration date on a driver's license and identifying the correct time of a meeting from a form. An example of the most demanding tasks is using a bus schedule to select the appropriate bus for given departures and arrivals.

Quantitative literacy—the knowledge and skills needed to apply the arithmetic operations, either alone or sequentially, that are embedded in printed materials, such as in balancing a checkbook, figuring out a tip, completing an order form, or determining the amount of interest from

> a loan advertisement. Task difficulty is associated with the particular operation required (addition, subtraction, multiplication, and division), the number of operations needed, and the extent to which the numerical information is embedded in print. For example, the easiest task requires totaling two entries on a bank deposit slip. The most difficult task is determining the amount of interest charges from a loan advertisement.

For additional descriptions of the literacy scales or further information on the procedures applied in estimating scale proficiencies, see *Literacy: Profiles of America's Young Adults.**

Education groupings presented here differ from those previously published in that volume, which were: less than high school (0–8 years), some high school (9–11 years), high school diploma/some postsecondary, and 2- or 4-year degree or more. The questionnaire item and grouping of educational attainment used in this analysis are as follows:

> What was the highest grade of public or private school you have completed? (NOTE: Open-ended responses to this question were recorded in the following groups.)

Less than high school graduate	Less than high school (0–8 years) Some high school (9–12 but did not graduate) High school equivalency certificate
High school graduate	High school graduate (12 years; accelerated or early graduate program)
Some postsecondary	Attended a vocational, trade, or business school after high school College: less than 2 years College: Associates degree (A.A.) College: 2 years or more, no degree
College graduate	College graduate (B.S. or B.A.) Postgraduate, no degree Postgraduate, degree (M.S., M.A., Ph.D., M.D., etc.)

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*I. Kirsch and A. Jungeblut, *Literacy: Profiles of America's Young Adults* (Princeton, N.J.: Educational Testing Service, 1986).

Table 2:13-1.—Percentage distribution of general education revenues of higher education, by control and level of institution and source of revenue: Fiscal year 1986

Source of revenue	Level of institution		
	All	4-year	2-year
	All institutions		
Total	100.0	100.0	100.0
Tuition and fees	27.0	28.8	16.4
Government appropriations	42.3	38.2	66.3
Federal	2.1	2.4	0.6
State and local	40.2	35.8	65.6
Government grants and contracts	17.5	17.9	15.1
Federal	15.0	15.6	11.6
State and local	2.5	2.3	3.5
Private gifts, grants and contracts	7.1	8.1	1.2
Endowment income	3.0	3.5	0.3
Sales and services of educaional activities	3.1	3.5	0.6
	Public institutions		
Total	100.0	100.0	100.0
Tuition and fees	14.6	15.2	12.1
Government appropriations	61.1	58.4	72.0
Federal	2.7	3.2	0.6
State and local	58.4	55.2	71.4
Government grants and contracts	16.4	16.9	14.6
Federal	13.8	14.6	10.9
State and local	2.6	2.3	3.7
Private gifts, grants and contracts	4.1	4.9	0.6
Endowment income	0.8	0.9	0.1
Sales and services of educational activities	3.1	3.7	0.6

Table 2:13-1.—Percentage distribution of general education revenues of higher education, by control and level of institution and source of revenue: Fiscal year 1986—Continued

Source of revenue	Level of institution		
	All	4-year	2-year
	Private institutions		
Total	100.0	100.0	100.0
Tuition and fees	53.4	52.9	66.7
Government appropriations	2.3	2.3	1.1
Federal	0.9	0.9	0.6
State and local	1.4	1.4	0.6
Government grants and contracts	19.8	19.8	21.4
Federal	17.5	17.4	19.4
State and local	2.4	2.4	2.0
Private gifts, grants and contracts	13.6	13.8	7.5
Endowment income	7.7	7.9	2.0
Sales and services of educational activities	3.2	3.3	1.3

NOTE: Percentages were calculated from unrounded data.

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1989* (based on the HEGIS survey Financial Statistics of Institutions of Higher Education, fiscal year 1986).

Table 2:13-2.—General education revenues (in current dollars) for institutions of higher education, by control of institution and source of revenue: Selected fiscal years 1976–1986

(In billions)

Source of revenue	1976	1978	1980	1982	1984	1986
			All institutions			
Total	$30.7	$36.5	$44.7	$54.7	$61.6	$76.1
Tuition and fees	8.2	9.9	11.9	15.8	17.6	20.6
Government appropriations	14.0	16.7	20.1	23.9	26.9	32.2
Federal	0.9	1.0	1.2	1.3	1.4	1.6
State and local	13.2	15.7	18.9	22.6	25.5	30.6
Government grants and contracts	5.2	5.9	7.5	8.2	8.8	13.3
Federal	4.5	5.1	6.5	7.0	7.4	11.4
State and local	0.7	0.8	1.0	1.2	1.4	1.9
Private gifts, grants and contracts	1.9	2.3	2.8	3.6	4.4	5.4
Endowment income	0.7	0.8	1.2	1.6	1.9	2.3
Sales and services of educational activities	0.6	0.9	1.2	1.6	2.0	2.4
			Public institutions			
Total	21.7	25.7	31.3	37.5	41.6	51.8
Tuition and fees	3.5	4.1	4.9	6.4	6.6	7.6
Government appropriations	13.8	16.4	19.7	23.4	26.4	31.6
Federal	0.8	0.9	1.0	1.1	1.2	1.4
State and local	13.0	15.5	18.7	22.3	25.2	30.2
Government grants and contracts	3.3	3.7	4.7	5.1	5.4	8.5
Federal	2.8	3.1	4.0	4.2	4.4	7.2
State and local	0.5	0.6	0.7	0.9	1.0	1.3
Private gifts, grants and contracts	0.6	0.8	1.0	1.3	1.6	2.1
Endowment income	0.1	0.1	0.2	0.2	0.3	0.4
Sales and services of educational services	0.4	0.6	0.8	1.1	1.3	1.6

Table 2:13-2.—General education revenues (in current dollars) for institutions of higher education, by control of institution and source of revenue: Selected fiscal years, 1976–1986—Continued

(In billions)

Source of revenue	1976	1978	1980	1982	1984	1986
	Private institutions					
Total	$9.0	$10.8	$13.6	$17.3	$20.0	$24.3
Tuition and fees	4.7	5.7	7.1	9.4	11.0	13.0
Government appropriations	0.3	0.4	0.4	0.5	0.5	0.5
Federal	0.1	0.2	0.2	0.2	0.2	0.2
State and local	0.2	0.2	0.2	0.3	0.3	0.3
Government grants and contracts	1.9	2.2	2.9	3.2	3.4	4.8
Federal	1.7	2.0	2.6	2.8	2.9	4.2
State and local	0.2	0.2	0.3	0.4	0.5	0.6
Private gifts, grants and contracts	1.3	1.5	1.8	2.3	2.8	3.3
Endowment income	0.6	0.7	1.0	1.4	1.6	1.9
Sales and services of educational activities	0.2	0.3	0.4	0.5	0.7	0.8

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics*, [various years] (based on the HEGIS survey Financial Statistics of Institutions of Higher Education, various years).

Table 2:13-3.—General education revenues (in constant 1986 dollars) for institutions of higher education, by control of institution and source of revenue: Selected fiscal years, 1976–1986

(In billions)

Source of revenue	1976	1978	1980	1982	1984	1986
			All institutions			
Total	$60.3	$63.4	$62.9	$63.2	$65.8	$76.1
Tuition and fees	16.0	17.1	16.7	18.2	18.8	20.6
Government appropriations	27.6	29.1	28.2	27.6	28.7	32.2
Federal	1.8	1.8	1.7	1.5	1.5	1.6
State and local	25.8	27.3	26.5	26.1	27.2	30.6
Government grants and contracts	10.2	10.2	10.6	9.5	9.4	13.3
Federal	8.8	8.8	9.2	8.1	7.9	11.4
State and local	1.4	1.4	1.5	1.4	1.5	1.9
Private gifts, grants and contracts	3.8	4.0	3.9	4.1	4.7	5.4
Endowment income	1.3	1.4	1.6	1.8	2.0	2.3
Sales and services of educational activities	1.3	1.5	1.7	1.8	2.1	2.4
			Public institutions			
Total	42.5	44.6	43.8	43.3	44.5	51.8
Tuition and fees	6.8	7.2	6.8	7.4	7.1	7.6
Government appropriations	27.0	28.5	27.6	27.0	28.2	31.6
Federal	1.5	1.6	1.4	1.3	1.3	1.4
State and local	25.5	26.9	26.2	25.8	26.9	30.2
Government grants and contracts	6.5	6.4	6.6	5.9	5.8	8.5
Federal	5.5	5.4	5.6	4.9	4.7	7.2
State and local	0.9	1.0	1.0	1.0	1.0	1.3
Private gifts, grants and contracts	1.2	1.3	1.4	1.5	1.7	2.1
Endowment income	0.2	0.2	0.3	0.3	0.3	0.4
Sales and services of educational activities	0.8	1.0	1.1	1.2	1.4	1.6

Table 2:13-3.—General education revenues (in constant 1986 dollars) for institutions of higher education, by control of institution and source of revenue: Selected fiscal years 1976–1986—Continued

(In billions)

Source of revenue	1976	1978	1980	1982	1984	1986
	Private institutions					
Total	17.7	18.8	19.1	19.9	21.3	24.3
Tuition and fees	9.2	9.9	10.0	10.8	11.7	13.0
Government appropriations	0.6	0.6	0.6	0.6	0.5	0.5
Federal	0.2	0.3	0.3	0.2	0.2	0.2
State and local	0.3	0.3	0.3	0.3	0.3	0.3
Government grants and contracts	3.8	3.8	4.1	3.7	3.6	4.8
Federal	3.3	3.4	3.6	3.3	3.1	4.2
State and local	0.5	0.4	0.5	0.4	0.5	0.6
Private gifts, grants and contracts	2.6	2.7	2.6	2.6	3.0	3.3
Endowment income	1.2	1.2	1.4	1.6	1.7	1.9
Sales and services of educational activities	0.4	0.6	0.6	0.6	0.7	0.8

SOURCE: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, [various years]* (based on the HEGIS survey Financial Statistics of Institutions of Higher Education, various years).

Table 2:14-1.—Index of expenditures (in constant dollars) per full-time-equivalent student at public institutions of higher education, by type of institution: Academic years ending 1977–1986

(1977 = 100)

	Educational and general expenditures[1]							
Year	Total	Instruction	Administration[2]	Research	Libraries	Public service	Operation and plant maintenance	Scholarships and fellowships
					Universities			
1977	100	100	100	100	100	100	100	100
1978	101	102	103	102	96	98	102	96
1979	103	103	104	106	94	103	105	90
1980	99	98	96	105	103	98	99	86
1981	96	95	96	103	89	99	96	85
1982	96	95	97	100	88	96	98	83
1983	97	97	98	102	91	97	101	85
1984	101	100	102	105	96	100	104	91
1985	107	105	112	114	98	106	109	96
1986	114	110	120	122	104	113	110	107
					Other 4-year			
1977	100	100	100	100	100	100	100	100
1978	101	101	102	102	100	100	102	90
1979	102	101	106	110	99	102	103	85
1980	100	97	105	114	98	106	102	84
1981	98	95	103	112	98	106	102	79
1982	99	97	103	107	94	105	104	71
1983	98	97	102	106	92	105	104	74
1984	100	98	110	108	97	108	99	74
1985	108	104	118	120	101	123	109	74
1986	114	110	125	132	104	129	105	84

Table 2:14-1.—Index of expenditures (in constant dollars) per full-time-equivalent student at public institutions of higher education, by type of institution: Academic years ending 1977–1986—Continued

(1977 = 100)

	Educational and general expenditures[1]							
Year	Total	Instruction	Administration[2]	Research	Libraries	Public service	Operation and plant maintenance	Scholarships and fellowships
					2-year			
1977	100	100	100	(3)	100	(3)	100	100
1978	101	100	105	(3)	101	(3)	102	76
1979	102	100	108	(3)	98	(3)	103	78
1980	97	96	102	(3)	89	(3)	102	78
1981	93	92	97	(3)	83	(3)	99	71
1982	93	93	98	(3)	90	(3)	102	66
1983	90	90	97	(3)	77	(3)	98	65
1984	92	92	100	(3)	78	(3)	100	64
1985	103	101	113	(3)	85	(3)	111	76
1986	108	106	121	(3)	89	(3)	115	81

[1] Data are in constant dollars, adjusted by the Consumer Price Index for the academic year (July–June). Mandatory transfers are included in the total but are not shown separately.

[2] Administration expenditures include institutional support, student services, and academic support minus library costs.

[3] Not calculated; expenditure category constituted 2.0 percent or less of total expenditures in most years.

SOURCE: U.S. Department of Education, Center for Education Statistics, "Recent Trends in Higher Education Finance, 1976–77 to 1985–86," *Higher Education Administrative Costs: Continuing the Study,* (based on the HEGIS surveys Financial Statistics of Institutions of Higher Education, Institutional Characteristics of Colleges and Universities, and Fall Enrollment in Colleges and Universities), January 1988.

Indicator 2:14

Table 2:14-2.—Index of expenditures (in constant dollars) per full-time-equivalent student at private, nonprofit institutions of higher education, by type of institution: Academic years ending 1977–1986

(1977 = 100)

Year	Educational and general expenditures[1]							
	Total	Instruction	Administration[2]	Research	Libraries	Public service	Operation and plant maintenance	Scholarships and fellowships
					Universities			
1977	100	100	100	100	100	100	100	100
1978	99	99	100	98	100	93	99	102
1979	98	97	104	97	92	92	101	98
1980	97	96	102	94	86	100	98	94
1981	97	97	102	91	86	90	101	98
1982	97	100	103	88	87	88	105	98
1983	100	104	112	85	87	93	105	101
1984	109	110	124	92	99	96	112	118
1985	115	115	130	99	97	125	117	127
1986	122	121	139	107	102	130	120	137
					Other 4-year			
1977	100	100	100	100	100	100	100	100
1978	100	100	101	95	100	90	101	98
1979	99	99	101	103	97	90	99	95
1980	98	96	100	103	92	88	100	96
1981	97	94	102	97	90	94	100	98
1982	99	96	105	91	90	104	101	101
1983	103	100	111	91	96	104	103	104
1984	108	104	116	95	99	108	106	115
1985	114	109	123	103	103	116	108	127
1986	120	113	130	115	107	128	110	139

Table 2:14-2.—Index of expenditures (in constant dollars) per full-time-equivalent student at private, nonprofit institutions of higher education, by type of institution: Academic years ending 1977–1986—Continued

(1977 = 100)

	Educational and general expenditures[1]							
Year	Total	Instruction	Administration[2]	Research	Libraries	Public service	Operation and plant maintenance	Scholarships and fellowships
					2-year			
1977	100	100	100	(3)	100	(3)	100	100
1978	95	94	98	(3)	96	(3)	93	93
1979	97	97	101	(3)	92	(3)	90	99
1980	93	92	98	(3)	87	(3)	86	102
1981	92	90	97	(3)	78	(3)	88	103
1982	90	89	98	(3)	75	(3)	83	91
1983	95	93	101	(3)	76	(3)	89	106
1984	96	91	104	(3)	77	(3)	93	115
1985	107	102	118	(3)	86	(3)	101	129
1986	110	106	122	(3)	87	(3)	102	133

[1] Data are in constant dollars, adjusted by the Consumer Price Index for the academic year (July–June). Mandatory transfers are included in the total but are not shown separately.

[2] Administration expenditures include institutional support, student services, and academic support minus library costs.

[3] Not calculated; expenditure category constituted 2.0 percent or less of total expenditures.

SOURCE: U.S. Department of Education, Center for Education Statistics, "Recent Trends in Higher Education Finance, 1976–77 to 1985–86," *Higher Education Administrative Costs: Continuing the Study,* (based on the HEGIS surveys Financial Statistics of Institutions of Higher Education, Institutional Characteristics of Colleges and Universities, and Fall Enrollment in Colleges and Universities), January 1988.

Table 2:14-3.—Index of average undergraduate tuition charges (in constant dollars) at institutions of higher education, by type and control of institution: Academic years ending 1977–1986

(1977 = 100)

	Public institutions			Private institutions		
Year	University	Other 4-year	2-year	University	Other 4-year	2-year
1977	100	100	100	100	100	100
1978	100	99	101	99	100	100
1979	97	94	99	98	101	99
1980	92	89	95	94	97	98
1981	90	87	92	95	98	103
1982	94	90	95	100	102	106
1983	101	99	100	109	110	113
1984	107	108	108	117	116	112
1985	112	110	115	124	121	121
1986	118	115	118	132	127	127

NOTE: Tuition charges (tuition and fees) are in constant dollars, adjusted by the Consumer Price Index for the academic year (July–June). They are for the entire academic year and are average charges paid by students. They were calculated on the basis of full-time-equivalent undergraduates. Tuition at public institutions is the charge to in-State students. The amount at private institutions includes charges at both nonprofit and proprietary schools.

SOURCE: U.S. Department of Education, Center for Education Statistics, "Recent Trends in Higher Education Finance, 1976–77 to 1985–86," *Higher Education Administrative Costs: Continuing the Study*, (based on the HEGIS survey Financial Statistics of Institutions of Higher Education, Institutional Characteristics of Colleges and Universities, and Fall Enrollment in Colleges and Universities), January 1988.

Table 2:15-1.—Average faculty salaries (in constant 1985-86 dollars) in institutions of higher education, by academic rank and control and type of institution: Academic years ending 1972-1986

	All institutions			Public institutions			Private institutions		
Year	Professor	Associate professor	Assistant professor	Professor	Associate professor	Assistant professor	Professor	Associate professor	Assistant professor
				All institutions					
1972	$48,525	$36,746	$30,374	$49,018	$37,399	$30,904	$47,553	$35,280	$29,140
1973	48,759	37,041	30,577	49,427	37,874	31,227	47,450	35,190	29,084
1975	44,673	33,884	27,921	45,344	34,814	28,690	43,281	31,690	26,131
1976	44,354	33,400	27,397	45,021	34,328	28,145	43,020	31,230	25,732
1977	44,115	33,199	27,186	44,671	34,036	27,867	42,928	31,134	25,631
1978	43,669	32,990	26,963	44,294	33,853	27,724	42,289	30,790	25,260
1979	42,045	31,843	26,008	42,555	32,664	26,734	40,871	29,735	24,330
1980	39,791	30,068	24,481	40,349	30,895	25,211	38,498	28,006	22,852
1981	38,638	29,166	23,747	39,045	29,867	24,413	37,684	27,431	22,322
1982	38,778	29,280	23,850	38,948	29,875	24,480	38,371	27,782	22,519
1983	39,396	29,842	24,449	39,322	30,313	24,983	39,575	28,684	23,338
1985	40,896	30,813	25,383	40,667	31,236	25,885	41,448	29,803	24,352
1986	42,268	31,787	26,277	42,328	32,367	26,951	42,118	30,400	24,891
				4-year institutions					
1972	48,858	36,771	30,347	49,446	37,426	30,884	47,745	35,408	29,221
1973	49,117	37,016	30,469	49,913	37,865	31,121	47,659	35,295	29,150
1975	44,987	33,775	27,722	45,796	34,720	28,486	43,438	31,790	26,210
1976	44,684	33,385	27,338	45,472	34,375	28,137	43,216	31,331	25,811
1977	44,356	33,188	27,144	45,005	34,095	27,882	43,047	31,197	25,690
1978	43,886	32,960	26,863	44,596	33,899	27,651	42,418	30,858	25,315
1979	42,291	31,847	25,918	42,896	32,751	26,693	40,985	29,808	24,396
1980	40,072	30,093	24,405	40,743	31,022	25,190	38,625	28,072	22,916
1981	38,968	29,230	23,704	39,504	30,026	24,428	37,804	27,499	22,385
1982	39,112	29,341	23,819	39,403	30,032	24,513	38,466	27,830	22,576
1983	39,783	29,944	24,448	39,815	30,496	25,038	39,715	28,765	23,410
1985	41,416	30,964	25,449	41,341	31,482	26,020	41,581	29,891	24,446
1986	42,803	31,940	26,335	43,044	32,642	27,100	42,260	30,486	24,987
				Universities					
1972	52,865	38,826	31,771	52,038	38,596	31,596	54,939	39,511	32,358
1973	52,961	38,906	31,833	52,223	38,721	31,675	54,669	39,425	32,325
1975	48,457	35,403	28,874	47,726	35,337	28,894	50,020	35,572	28,826
1976	48,331	35,205	28,634	47,624	35,271	28,774	49,764	35,036	28,311
1977	48,059	34,959	28,341	47,234	34,900	28,367	49,897	35,126	28,277
1978	47,378	34,555	27,915	46,551	34,444	27,868	49,251	34,868	28,029
1979	45,862	33,415	26,949	45,055	33,352	26,906	47,776	33,595	27,060
1980	43,279	31,436	25,303	42,457	31,357	25,274	45,243	31,652	25,378
1981	42,243	30,646	24,731	41,392	30,490	24,672	44,259	31,071	24,867
1982	42,424	30,777	25,010	41,294	30,494	24,872	45,174	31,580	25,336
1983	43,645	31,594	25,937	42,168	31,133	25,620	47,286	32,914	26,709
1985	45,398	32,624	27,129	43,508	31,965	26,656	50,016	34,441	28,271
1986	46,994	33,704	28,242	45,322	33,133	27,887	51,355	35,307	29,125

Table 2:15-1.—Average faculty salaries (in constant 1985–86 dollars) in institutions of higher education, by academic rank and control and type of institution: Academic years ending 1972–1986—Continued

	All institutions			Public institutions			Private institutions		
Year	Professor	Associate professor	Assistant professor	Professor	Associate professor	Assistant professor	Professor	Associate professor	Assistant professor
				Other 4-year					
1972	$44,230	$35,004	$29,300	$45,784	$36,195	$30,219	$42,045	$33,120	$27,876
1973	44,862	35,431	29,517	46,888	37,002	30,640	41,944	32,940	27,773
1975	41,628	32,681	27,077	43,783	34,259	28,230	37,915	29,774	25,060
1976	41,188	32,209	26,627	43,269	33,733	27,752	37,572	29,400	24,680
1977	40,896	32,065	26,472	42,786	33,520	27,574	37,423	29,307	24,555
1978	40,772	31,975	26,280	42,753	33,523	27,515	36,988	28,959	24,146
1979	39,210	30,910	25,349	40,927	32,351	26,560	35,801	28,069	23,268
1980	37,322	29,267	23,895	39,182	30,791	25,135	33,649	26,387	21,858
1981	36,182	28,342	23,115	37,814	29,700	24,267	32,884	25,759	21,282
1982	36,405	28,475	23,156	37,778	29,718	24,280	33,583	26,128	21,428
1983	36,715	28,946	23,628	37,826	30,054	24,659	34,469	26,930	22,091
1985	38,288	29,940	24,519	39,530	31,139	25,605	35,796	27,831	22,903
1986	39,610	30,864	25,314	41,170	32,296	26,597	36,455	28,365	23,412
				2-year					
1972	39,049	36,387	30,666	40,241	37,113	31,065	27,281	27,090	24,544
1973	42,363	37,353	31,559	43,416	37,948	31,914	27,183	28,149	25,244
1975	39,874	34,962	29,329	40,573	35,480	29,698	26,219	25,547	22,385
1976	38,784	33,544	27,853	39,732	34,006	28,188	24,327	24,749	21,761
1977	38,923	33,305	27,526	39,596	33,596	27,781	26,309	25,881	22,230
1978	39,651	33,264	27,838	40,348	33,549	28,073	24,570	25,060	21,620
1979	37,678	31,805	26,668	38,222	32,094	26,941	25,090	24,160	20,440
1980	35,184	29,845	25,044	35,724	30,099	25,315	23,204	22,682	19,042
1981	33,330	28,583	24,080	33,772	28,831	24,336	23,426	22,219	18,423
1982	33,751	28,733	24,087	34,056	28,895	24,317	24,747	23,253	18,813
1983	34,009	28,966	24,451	34,428	29,208	24,708	23,089	21,825	19,026
1985	34,470	29,532	24,878	34,785	29,776	25,182	24,264	21,997	18,975
1986	36,076	30,483	25,823	36,418	30,733	26,162	24,519	22,291	19,297

NOTE: Salaries are for full-time instructional faculty on 9- or 10-month contracts. They have been converted to constant dollars for the academic year 1985–86 (July 1–June 30) using the Consumer Price Index (CPI).

SOURCE: U.S. Department of Education, Center for Education Statistics, *Salaries and Fringe Benefits, 1971–72 and 1972–73; Salaries and Tenure of Instructional Faculty in Institutions of Higher Education, 1974–75; Salaries, Tenure and Fringe Benefits of Full-Time Instructional Staff in Institutions of Higher Education 1975–76;* "College Faculty Salaries 1976–86," *OERI Bulletin*, 1987; and *Digest of Education Statistics, 1987.*

Table 2:15-2.—Average faculty salaries (in current dollars) in institutions of higher education, by academic rank and control and type of institution: Academic years ending 1972–1986

	All institutions			Public institutions			Private institutions		
Year	Professor	Associate professor	Assistant professor	Professor	Associate professor	Assistant professor	Professor	Associate professor	Assistant professor
All institutions									
1972	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1973	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1975	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1976	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1977	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1978	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1979	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1980	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1981	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1982	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1983	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1985	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1986	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4-year institutions									
1972	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1973	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1975	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1976	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1977	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1978	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1979	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1980	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1981	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1982	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1983	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1985	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1986	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Universities									
1972	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1973	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1975	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1976	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1977	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1978	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1979	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1980	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1981	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1982	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1983	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1985	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1986	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Table 2:15-2.—Average faculty salaries (in current dollars) in institutions of higher education, by academic rank and control and type of institution: Academic years ending 1972–1986—Continued

	All institutions			Public institutions			Private institutions		
Year	Professor	Associate professor	Assistant professor	Professor	Associate professor	Assistant professor	Professor	Associate professor	Assistant professor
					Other 4-year				
1972	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1973	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1975	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1976	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1977	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1978	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1979	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1980	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1981	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1982	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1983	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1985	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1986	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
					2-year				
1972	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1973	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1975	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1976	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1977	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1978	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1979	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1980	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1981	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1982	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1983	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1985	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1986	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

NOTE: Salaries are for full-time instructional faculty on 9- or 10-month contracts.

SOURCE: U.S. Department of Education, Center for Education Statistics, *Salaries and Fringe Benefits, 1971–72 and 1972–73; Salaries and Tenure of Instructional Faculty in Institutions of Higher Education, 1974–75; Salaries, Tenure and Fringe Benefits of Full-Time Instructional Staff in Institutions of Higher Education, 1975–76*; "College Faculty Salaries 1976–86," *OERI Bulletin*, 1987; and *Digest of Education Statistics, 1987*.

Table 2:15-3.—Index of average salaries (current dollars) of full-time instructional faculty[1] in institutions of higher education, by academic rank, and selected other professional occupations in medium-sized and large private firms: Academic years ending 1972–1986 (base year = academic year 1971–72)

Occupation	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Full professor	100	105	(2)	116	123	130	137	144	155	168	183	194	(3)	217	230
Associate professor	100	105	(2)	116	123	129	137	144	154	167	182	194	(3)	216	229
Assistant professor	100	105	(2)	116	122	128	135	143	152	165	180	192	(3)	215	229
Accountant	100	105	111	122	130	140	152	164	179	197	218	231	242	233	254
Chief accountant	100	106	113	123	131	145	157	169	186	206	229	239	252	268	282
Auditor	100	105	111	118	125	133	144	153	167	184	201	214	221	240	246
Attorney	100	106	112	121	129	135	148	161	176	193	215	231	242	257	274
Chemist	100	104	111	122	130	139	152	164	180	196	217	230	242	255	266
Engineer	100	105	111	120	128	136	149	161	177	196	216	232	244	256	267

[1] On 9- or 10-month contracts.

[2] Faculty salaries are not available for 1974.

[3] Data for 1984 were not edited and thus could not be used.

NOTE: Faculty salaries are for the period of the 9- or 10-month contract, and the salaries for other occupations are for March of the year.

SOURCE: U.S. Department of Education, National Center for Education Statistics, the HEGIS survey Salaries, Tenure, and Fringe Benefits of Full-Time Instructional Faculty, various years. U.S. Department of Labor, Bureau of Labor Statistics, *National Survey of Professional, Administrative, Technical, and Clerical Pay, March 1982 and March 1986.*

Table 2:16-1.—Enrollment in institutions of higher education, by type and control: Selected years, 1970-1987

Fall of year	All institutions	Total		Public		Private	
		Public	Private	4-year	2-year	4-year	2-year
	Enrollment (in thousands)						
1970	8,581	6,428	2,153	4,326	2,102	2,032	121
1972	9,215	7,071	2,144	4,430	2,641	2,029	115
1974	10,224	7,989	2,235	4,704	3,285	2,117	119
1976	11,012	8,653	2,359	4,901	3,752	2,227	132
1978	11,260	8,786	2,475	4,912	3,874	2,320	155
1980	12,097	9,457	2,640	5,128	4,329	2,442	197
1982	12,426	9,696	2,730	5,176	4,520	2,478	252
1983	12,465	9,683	2,782	5,223	4,459	2,518	264
1984	12,242	9,477	2,765	5,198	4,279	2,513	251
1985	12,247	9,479	2,768	5,210	4,270	2,506	262
1986*	12,398	9,600	2,797	5,254	4,346	2,499	—
1987*	12,544	9,706	2,838	5,268	4,439	2,548	—

— Not available.

* Estimates based on a sample survey.

NOTE: Detail may not add to totals due to rounding.

SOURCES: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics*, 1988 (based on the HEGIS survey Fall Enrollment in Institutions of Higher Education, various years); "National Estimates of Higher Education Statistics: 1987," *Early Estimates*, 1987.

Table 2:17-1.—Trends in total enrollment in institutions of higher education, by part-time students, women, students 25 years or older, and graduate and professional students: Selected years, 1970–1987

Fall of year	Total enrollment	Part-time students	Women students	Students 25 years or older[1]	Graduate and professional students
	In thousands		Percent of total enrollment		
1970	8,581	32.2	41.2	—	14.1
1972	9,215	34.1	43.1	28.0	13.8
1974	10,224	37.7	45.0	32.8	13.9
1976	11,012	39.0	47.2	33.0	14.4
1978	11,260	40.8	49.9	34.8	14.0
1980	12,097	41.3	51.4	34.3	13.4
1982	12,426	41.9	51.5	35.6	12.9
1984	12,242	42.0	52.1	36.2	13.3
1986[2]	12,398	42.3	52.8	38.6	13.5
1987[2]	12,544	42.5	52.1	—	13.1

— Not available.

[1] Data on the percentage of students aged 25 or older come from the Bureau of the Census. Years 1972 to 1980 are controlled to the 1970 census base. Years 1981 to 1986 are controlled to the 1980 census base.

[2] Estimated.

SOURCES: U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 1988* (based on the HEGIS survey Fall Enrollment in Colleges and Universities, various years); and "National Estimates of Higher Education Statistics: 1987," *Early Estimates*, 1987. U.S. Department of Commerce, Bureau of the Census, "School Enrollments—Social and Economic Characteristics of Students, October [various years]," *Current Population Reports*, Series P-20; and unpublished tabulations.

Table 2:17-2.—Standard errors for percent of students 25 years old or older enrolled in a higher education institution: Selected years, 1972–1986 (table 2:17-1)

Fall of year*	Percent of students 25 years old or older
1972	0.67
1974	.67
1976	.63
1978	.64
1980	.68
1982	.66
1984	.66
1986	.63

SOURCE: U.S. Department of Commerce, Bureau of the Census, "School Enrollment—Social and Economic Characteristics of Students, October [various years]," *Current Population Reports*, Series P-20; and unpublished tabulations.

Indicator 2:18

Table 2:18-1.—Population and college enrollment, by selected age groups: 1980–1986

(Numbers in thousands)

Year	Total college enrollment[1]	Population 18 to 24 years old			Population 25 years old and over		
			Enrolled in college			Enrolled in college	
		Total[2]	Number	Percent of total	Total[2]	Number	Percent of total
1980	11,387	29,252	7,226	24.7	132,730	3,910	2.9
1981	12,127	29,307	7,575	25.8	135,417	4,321	3.2
1982	12,308	29,162	7,678	26.3	138,223	4,377	3.2
1983	12,320	28,847	7,477	25.9	140,970	4,583	3.3
1984	12,304	28,323	7,591	26.8	143,671	4,460	3.1
1985	12,524	27,707	7,537	27.2	146,341	4,724	3.2
1986	12,401	26,976	7,397	27.4	149,115	4,788	3.2

[1] Total includes a few students between the ages of 14 and 17.

[2] Data have been revised from previously published figures.

SOURCES: U.S. Department of Commerce, Bureau of the Census, "Estimates of the Population of the United States, by Age, Sex and Race: 1980 to 1986," *Current Population Reports*, Series P-25, No. 1,000; "School Enrollment—Social and Economic Characteristics of Students: October 1983," *Current Population Reports*, Series P-20, No. 413; and unpublished tabulations.

Table 2:18-2.—Standard errors for college enrollment, by selected age groups and population of 18- to 24-year-olds: 1980–1986 (table 2:18-1)

	Population 18 to 24 years old			Population 25 years old and over		
		Enrolled in college			Enrolled in college	
Year	Total	Number*	Percent of total	Total	Number	Percent of total
		In thousands			In thousands	
1980	—	115	0.36	—	87	0.07
1981	—	126	.39	—	97	.07
1982	—	127	.39	—	98	.07
1983	—	125	.39	—	100	.07
1984	—	126	.40	—	99	.07
1985	—	126	.41	—	101	.07
1986	—	125	.41	—	102	.07

—Not applicable. These estimates are not considered samples but adjustments to 1980 Census data. Therefore, no standard errors are included.

SOURCE: U.S. Department of Commerce, Bureau of the Census, "School Enrollment—Social and Economic Characteristics of Students, October [various years]," *Current Population Reports*, Series P-20; and unpublished tabulations.

Table 2:19-1.—Participation rates of 18- to 24-year-olds in higher education, by race/ethnicity: 1970–1986

Fall of year	White	Black	Hispanic*
		Percent enrolled	
1970	27.1	15.5	—
1971	27.2	18.2	—
1972	26.4	18.1	13.4
1973	25.0	16.0	16.0
1974	25.2	17.9	18.1
1975	26.9	20.7	20.4
1976	27.1	22.6	19.9
1977	26.5	21.3	17.2
1978	25.7	20.1	15.2
1979	25.6	19.8	16.6
1980	26.2	19.2	16.1
1981	26.7	19.9	16.7
1982	27.2	19.8	16.8
1983	27.0	19.2	17.2
1984	28.0	20.4	17.9
1985	28.7	19.7	16.9
1986	28.3	21.8	17.6

— Not available.

* Hispanics may be of any race.

SOURCE: U.S. Department of Commerce, Bureau of the Census, "School Enrollments—Social and Economic Characteristics of Students, October [various years]," *Current Population Reports*, Series P-20.

Table 2:19-2.—Standard errors for participation rates of 18- to 24-year-olds in higher education, by race/ethnicity: 1970–1986 (table 2:19-1)

Fall of year	White	Black	Hispanic*
1970	0.5	1.1	—
1971	.4	1.1	—
1972	.4	1.1	1.4
1973	.4	1.0	1.4
1974	.4	1.0	1.5
1975	.4	1.1	1.6
1976	.4	1.1	1.5
1977	.4	1.1	1.4
1978	.4	1.0	1.3
1979	.4	1.0	1.3
1980	.4	1.1	1.3
1981	.4	1.2	1.3
1982	.4	1.0	1.4
1983	.4	1.0	1.4
1984	.4	1.0	1.3
1985	.5	1.0	1.4
1986	.5	1.1	1.2

—Not available.

*Hispanics may be of any race.

SOURCE: U.S. Department of Commerce, Bureau of the Census, "School Enrollments—Social and Economic Characteristics of Students, October [various years]," *Current Population Reports*, Series P-20.

B. Sources of Data

Sources of Data

General Information

The information presented in this report was obtained from many sources, including Federal and State agencies, private research organizations, and professional associations. The data were collected using many research methods including surveys of a universe (such as all colleges) or of a sample, compilations of administrative records, and statistical projections. Users of this report should take particular care when comparing data from different sources. Differences in procedures, timing, phrasing of questions, interviewer training, and so forth mean that the results from the different sources are not strictly comparable. Following the general discussion of data accuracy below, descriptions of the information sources and data collection methods are presented, grouped by sponsoring organization. More extensive documentation of one survey's procedures than of another's does not imply more problems with the data, only that more information is available.

Unless otherwise noted, all comparisons cited in the text were tested for significance using t-tests and are significant at the .05 level. When other tests were used, they are described in the supplemental note for the indicator.

The accuracy of any statistic is determined by the joint effects of "sampling" and "nonsampling" errors. Estimates based on a sample will differ somewhat from the figures that would have been obtained if a complete census had been taken using the same survey instruments, instructions, and procedures. In addition to such sampling errors, all surveys, both universe and sample, are subject to design, reporting, and processing errors and errors due to nonresponse. To the extent possible, these nonsampling errors are kept to a minimum by methods built into the survey procedures. In general, however, the effects of nonsampling errors are more difficult to gauge than those produced by sampling variability.

The *standard error* is the primary measure of sampling variability. It provides a specific range—with a stated confidence—within which a given estimate would lie if a complete census had been conducted. The chances that a complete census would differ from the sample by less than the standard error are about 68 out of 100. The chances that the difference would be less than 1.65 times the standard error are about 90 out of 100; that the difference would be less than 1.96 times the standard error, about 95 out of 100; and that it would be less than 2.5 times as large, about 99 out of 100.

To illustrate this further, consider table 1:1-3 for estimates of standard errors from NAEP reading assessments. For an estimate of the average reading proficiency (on a 0 to 100 scale) of 38.1 for all students in grade 3, the table shows a standard error of 0.2. This means that the chances are about 95 out of 100 that the estimate of 38.1 is within + *or* − 1.96 × .2 of the estimate that would result from a complete census. Therefore, the 95 percent confidence interval is 37.7 to 38.5.

Standard errors can help assess how valid a comparison between two estimates might be. The *standard error of a difference* between two sample estimates is approximately equal to the square root of the sum of the squared standard errors of the estimates. The standard error (se) of the difference between sample estimate "a" and sample estimate "b" (if "a" and "b" are approximately independent) is:

$$se_{a,b} = \sqrt{se_a^2 + se_b^2}$$

It should be noted that most of the standard errors presented in the indicators and in the original documents are approximations. That is, to derive estimates of standard errors that would be applicable to a wide variety of items and could be prepared at a moderate cost, a number of approximations were required. As a result, most of the standard errors presented provide a general order of magnitude rather than the exact standard error for any specific item.

The preceding discussion on sampling variability was directed toward a situation concerning one or two estimates. Determining the accuracy of statistical projections is more difficult. In general, the further away the projection date is from the date of the actual data being used for the projection, the greater the possible error in the projection. If for instance annual data from 1970 to 1987 are being used to project enrollment in institutions of higher education, the further beyond 1987 one projects, the more variability in the projection. One will be less sure of the 1992 enrollment projection than of the 1988 projection. A detailed discussion of the projections methodology is contained in *Projections of Education Statistics to 1997–98* (National Center for Education Statistics, forthcoming).

Both universe and sample surveys are subject to nonsampling errors. Nonsampling errors are of two kinds—random and nonrandom. *Random nonsampling* errors may arise when respondents or interviewers interpret questions differently, when respondents must estimate values, or when coders, keyers, and other processors handle answers differently. *Nonrandom nonsampling errors* result from total nonresponse (no usable data obtained for a sampled unit), partial or item nonresponse (only a portion of a response may be usable), inability or unwillingness on the part of respondents to provide correct information, difficulty interpreting questions, mistakes in recording or keying data, errors of collection or processing, and overcoverage or undercoverage of the target universe. Random nonresponse errors usually, but not always, result in an understatement of sampling errors and thus an overstatement of the precision of survey estimates. Since estimating the magnitude of nonsampling errors would require special experiments or access to independent data, these magnitudes are seldom available.

To compensate for suspected nonrandom errors, adjustments of the sample estimates are often made. For example, adjustments are frequently made for nonresponse, both total and partial. An adjustment made for either type of nonresponse is often referred to as as an *imputation*—substitution of the "average" questionnaire response for the nonresponse. Imputations are usually made separately within various groups of sample members which have similar survey characteristics. Imputation for item nonresponse is usually made by substituting for a missing item the response to that item of a respondent having characteristics that are similar to those of the nonrespondent.

1. Federal Agency Sources

Bureau of the Census
U.S. Department of Commerce

Current Population Survey

Current estimates of school enrollment as well as social and economic characteristics of students are based on data collected in the Census Bureau's monthly household survey of about 60,000 households. The monthly "Current Population Survey" (CPS) sample consists of 614 areas comprising 1,113 counties, independent cities, and minor civil divisions throughout the 50 States and the District of Columbia. The sample was initially selected from the 1970 census files and is periodically updated to reflect new housing construction when possible.

The monthly CPS deals primarily with labor force data for the civilian noninstitutional population (i.e., excluding military personnel and their families living on post and inmates of institutions). In addition, supplemental questions are asked about the education of all eligible members of the household. The October 1982 survey obtained information about highest grade completed, level of current enrollment, attendance status, number and type of courses, degree or certificate objective, and type of organization offering instruction. Information on enrollment status by grade is gathered each October. Information on annual earning is obtained in March, thus permitting a crossclassification of earning by educational attainment.

The estimation procedure employed for the monthly CPS data involves inflating weighted sample results to independent estimates of characteristics of the civilian noninstitutional population in the United States by age, sex, and race. These independent estimates are based on statistics from decennial censuses; statistics on births, deaths, immigration, and emigration; and statistics on the population in the armed services. Generalized standard error tables are provided in the *Current Population Reports*. The data are subject to both nonsampling and sampling errors.

Further information is available in the *Current Population Reports*, Series P-20, or by contacting:

Population Division
Bureau of the Census
U.S. Department of Commerce
Washington, DC 20233

School Enrollment. Each October, the "Current Population Survey" (CPS) includes supplemental questions on the enrollment status of the population aged 3 years old and over. The main sources of nonsampling variability in the responses to the supplement are those inherent in the survey instrument. The question concerning educational attainment may be sensitive for some respondents, who may not want to acknowledge the lack of a high school diploma. The question of current enrollment may not be answered accurately for various reasons. Some respondents may not know current grade information for every student in the household, a problem especially prevalent for households with members in college or in nursery school. Confusion over college credits or hours taken by a student may make it difficult to determine the year in which the student is enrolled. Problems may occur with the definition of nursery school (a group or class organized to provide educational experiences for children) where respondents' interpretations of "educational experiences" vary.

Questions concerning the CPS "School Enrollment" survey may be directed to:

Education and Social Stratification Branch
Bureau of the Census
U.S. Department of Commerce
Washington, DC 20233

Educational Attainment. Data on years of school completed are derived from two questions on the "Current Population Survey" (CPS) instrument. Formal reports documenting educational attainment are produced by the Bureau of the Census using March CPS results. The latest report is "Educational Attainment in the United

States, March 1982 to 1985," Series P-20, No. 415, which is available from the Government Printing Office. Data for 1986 may be obtained from the Bureau of the Census.

In addition to the general constraints of the CPS, some data indicate that the respondents have a tendency to overestimate the educational level of members of their household. Some inaccuracy is due to a lack of the respondent's knowledge of the exact educational attainment of each household member and the hesitancy to acknowledge anything less than a high school education. Another cause of nonsampling variability is the change in the numbers in the armed services over the years. In 1970, 25 percent of all males 20 and 21 years old were in the armed services. By 1974, this had decreased to less than 10 percent. The exclusion of members of the armed services appears to increase the proportion of the CPS population with some college and decrease the proportion of those who finished high school but went no further. After 1974, there was more stability in the proportion of young men in the military.

Beginning with the data for March 1982, tabulations have been controlled for the 1980 census. The figures shown in the table hold for total or white population estimates only. The variability in estimates for subgroups (region, household relationships, etc.) can be estimated using the tables presented in *Current Population Reports*.

Questions concerning "Educational Attainment in the United States" may be directed to:

Education and Social Stratification Branch
Bureau of the Census
U.S. Department of Commerce
Washington, DC 20233

Bureau of Labor Statistics
U.S. Department of Labor

National Survey of Professional, Administrative, Technical, and Clerical Pay (PATC)

Each year, starting in 1960, this survey has collected data on the annual salaries of selected professional, administrative, technical, and clerical occupations in private industry. Its purpose is to gather information on private sector salaries for use in assessing Federal pay levels.

The sample consists of private establishments in the United States, except Alaska and Hawaii, engaged in the following industries: mining; construction; manufacturing; transportation, communications, electric, gas, and sanitary services; wholesale trade; retail trade; finance, insurance, and real estate; and services. Before 1986, the sample was restricted to establishments employing a minimum of 100–250 workers. Starting with the 1986 survey, the minimum was lowered to 50 workers. The data reported in this volume are limited to establishments meeting the pre-1986 minimum.

If data are not provided by a sample member, the weights of responding sample establishments are increased to adjust for the missing data. The weights for establishments which are out of business or outside the scope of the survey are changed to zero. In the March 1986 survey, salary data were not available from 13 percent of the sample establishments. An additional 6 percent of the sample establishments were either out of business or outside the scope of the survey.

Employees are classified by occupation and work level. Salaries reported for these occupations are those paid to full-time employees for standard work schedules, i.e., the salary corresponding to the employee's normal work schedule excluding overtime hours and premium pay for work on weekends, holidays, and late shifts. The average salary for a specific occupational level is obtained by dividing total wages for that level by the corresponding total employment. Year-to-year changes in average salaries reflect not only general salary increases and merit or other increases in the same work level category, but also other factors such as employee turnover, expansions or contractions in the work force, and changes in staffing patterns within establishments with different salary levels.

The survey is subject to both sampling and nonsampling errors.

Further information on this survey can be obtained from *National Survey of Professional, Administrative, Technical, and Clerical Pay* (various years), published by the Bureau of Labor Statistics, or by contacting:

Branch of White Collar Salary Surveys
Division of Occupational Pay and Benefit Levels
Bureau of Labor Statistics
441 G Street NW (Room 1283)
Washington, D.C. 20212

National Center for Education Statistics
U.S. Department of Education

Common Core of Data

The National Center for Education Statistics (NCES) uses the "Common Core of Data" (CCD) survey to acquire and maintain statistical data on the fifty States, the District of Columbia, and the outlying areas from the universe of State-level education agencies. Information about staff and students is collected annually at the school, LEA (local education agency or school district) and State levels. Information about revenues and expenditures is also collected at the State level.

Data are collected for a particular school year (July 1 through June 30) via survey instruments sent to the States by October 15 of the subsequent school year. States have 2 years in which to modify the data originally submitted.

Since the CCD is a universe survey, the CCD information presented in this report is not subject to sampling error. However, nonsampling error could come from two sources—nonreturn and inaccurate reporting. Almost all of the States submit the six CCD survey instruments each year, but there are many delays in submitting data and the submissions are sometimes incomplete.

Understandably, when 57 education agencies compile and submit data for over 85,000 public schools and approximately 15,800 local school districts, misreporting can occur. Typically, this results from varying interpretation of NCES definitions and differing recordkeeping systems. NCES attempts to minimize these errors by working closely with the Council of Chief State School Officers (CCSSO) and its Committee on Evaluation and Information Systems (CEIS).

The State education agencies report data to NCES from data collected and edited in the regular reporting cycles for which NCES reimburses them. NCES encourages the agencies to incorporate into their own survey systems the NCES items they do not already collect so that those items will also be available for the subsequent CCD survey. Over time this has meant fewer missing data cells in each State's responses, reducing the need to impute data.

NCES subjects data from the education agencies to a comprehensive edit. Where data are determined to be inconsistent, missing, or out of range, NCES contacts the education agencies for verification. NCES-prepared State summary forms are returned to the State education agencies for verification. States are also given an opportunity to revise their State-level aggregates from the previous survey cycle.

Questions concerning the "Common Core of Data" can be directed to:

George Wade
Elementary and Secondary Education Statistics Division
National Center for Education Statistics
555 New Jersey Avenue NW
Washington, DC 20208

Higher Education General Information Survey

The "Higher Education General Information Survey" (HEGIS) is a coordinated effort administered by NCES to acquire and maintain statistical data on the characteristics and operations of institutions of higher education. Developed in 1966, HEGIS is an annual universe survey of institutions listed in the latest NCES *Education Directory, Colleges and Universities*.

The information presented in this report draws on HEGIS surveys which solicit information concerning institutional characteristics, faculty salaries, finances, enrollment, and degrees. Since these surveys cover all institutions in the universe, the data presented are not subject to sampling error. However they are subject to nonsampling error, the sources of which vary with the survey instrument. Each survey will therefore be discussed separately. Information concerning the nonsampling error of the enrollment and degrees surveys draws extensively on the "HEGIS Post-Survey Validation Study" conducted in 1979.

Institutional Characteristics of Colleges and Universities. This survey provides the basis for the universe of institutions presented in the *Education Directory, Colleges and Universities*, and it is used in all other HEGIS data collection activities. The universe comprises institutions that offer at least a 1-year program of college-level studies leading toward a degree and that meet certain accreditation criteria. In the fall, institutions included in the *Directory* the previous year receive a computer printout of their information to update. Institutions not previously included and which have applied for *Directory* listing are sent a questionnaire. All institutions reported are certified as eligible to be listed by the Division of Eligibility and Agency Evaluation within the U.S. Department of Education.

Fall Enrollment in Colleges and Universities. This survey has been part of the HEGIS series since its development. The enrollment survey does not appear to suffer significantly from problems associated with nonresponse: The 1985 response rate was 92 percent. Major sources of nonsampling error for this survey are classification problems, the unavailability of needed data, interpretation of definitions, the survey due date, and operational errors. Of these, the classification of students appears to be the main source of error. Institutions have problems in correctly classifying first-time freshmen, other first-time students, and unclassified students for both full-time and part-time categories. These problems occur most often at 2-year institutions (both private and public) and private 4-year institutions. In 1977–78, the classification problem led to an estimated overcount of 11,000 full-time students and an undercount of 19,000 part-time students. Although the ratio of error to the grand total was quite small (less than 1 percent), the percentage of errors was as high as 5 percent for detailed student levels and even higher at certain aggregation levels.

Salaries, Tenure, and Fringe Benefits of Full-Time Instructional Faculty. This survey has been conducted every year since 1966, except for 1973–74. Although the survey form has changed a number of times during these years, only comparable data are presented in the report. The data are collected from the colleges and universities in a summary fashion.

This survey differs from other HEGIS surveys in that imputations are not made for nonrespondents. Thus, there is some possibility that the salary averages presented in this report may differ from the results of a complete enumeration of all colleges and universities. The response rate for the 1984–85 survey was 86.3 percent. The response rate for public colleges was substantially higher than the response rate for private colleges. It is probable that the public colleges' salary data are more accurate than the data for private colleges. Other sources of nonsampling error include computational errors and misclassification in reporting and processing. NCES checks individual colleges' data for internal and longitudinal consistency and contacts the colleges to check inconsistent data.

Degrees and Other Formal Awards. This survey has been part of the HEGIS series since its development. However, the degree classification taxonomy was revised in 1970–71 and 1982–83. Though information from survey years 1970–71 through 1981–82 is directly comparable, care must be taken if information before or after that period is included in any comparison. Degrees-conferred trend tables arranged by the 1982–83 classification have been added to this volume to provide consistent data from 1970–71 to 1983–84. The nonresponse rate does not appear to be a significant source of nonsampling error for this survey. The return rate over the years has been extremely high, with the response rate for the 1983–84 survey at 95 percent. Because of the high return rate, nonsampling error caused by imputation would also be minimal.

The major sources of nonsampling error for this survey are differences between the HEGIS program taxonomy and taxonomies used by the colleges, classification of double majors and double degrees, operational problems, and survey timing. In the 1979 validation study, these sources of nonsampling error were found to contribute to an error rate of 0.3 percent overreporting of bachelor's degrees and 1.3 percent overreporting of master's degrees. The differences, however, varied greatly among fields. Over 50 percent of the fields selected for the validation study had no errors identified. Categories of fields that had large differences were business and management, education, engineering, letters, and psychology. It is also shown that differences in proportion to the published figures were less than 1 percent for most of the selected fields that had some errors. Exceptions to these were: master's and Ph.D. programs in labor and industrial relations (20 percent and 8 percent); bachelors's and master's programs in art education (3 percent and 4 percent); bachelor's and Ph.D. programs in business and commerce, and in distributive education (5 percent and 9 percent); master's programs in philosophy (6 percent); and Ph.D. programs in psychology (11 percent).

Financial Statistics of Institutions of Higher Education. This survey has been part of the HEGIS series since its development. A number of changes were made in the financial survey instruments in 1975. In 1982 another change was made to include Pell Grants in Federal restricted grants and contracts revenues and restricted scholarships and fellowships expenditures. While these changes were significant, only comparable information on trends is presented in this report, except where noted. Finance tables for this publication have been adjusted by subtracting the Pell Grant amounts from the later data to maintain comparability with pre-1982 data.

Other possible sources of nonsampling error in the financial statistics are nonresponse, imputation, and misclassification. The response rate has been over 90 percent for most of the years reported. The response rate for the latest (fiscal year 1985) survey was 87.6 percent.

Two general methods of imputation have been used. If the prior year's data were available for a nonresponding institution, these data were inflated using the Higher Education Price Index and adjusted according to changes in enrollments. If no previous year's data were available, current data were used from peer institutions selected for location (State or region), control, level, and enrollment size of institution. For the most recent years reported, the imputation method did not include the adjustment for changes in enrollments, and new institutions which never reported to HEGIS surveys were not imputed. For the fiscal year 1985 survey,

survey forms were mailed to 3,379 institutions. Reports were received from 2,959 institutions, and data for 370 institutions were estimated based on their fiscal year 1984 reports inflated by the Higher Education Price Index. The remaining 50 institutions were not imputed because they had never responded to HEGIS surveys. It should be noted that the imputed current-fund expenditures of the nonrespondents have generally been less than 3 percent of the aggregate U.S. total.

To reduce reporting error, NCES uses national standards for reporting finance statistics. These standards are contained in *Colleges and University Business Administration: Administrative Services (1974 Edition)*, published by the National Association of College and University Business Officers; *Audits of Colleges and Universities* (as amended August 31, 1974), by the American Institute of Certified Public Accountants; and *HEGIS Financial Reporting Guide (1980)*, by NCES. Wherever possible, definitions and formats in the survey form are consistent with those in these three accounting texts.

Questions concerning the surveys used as data sources for this report or other questions concerning HEGIS can be directed to:

Postsecondary Education Statistics Division
National Center for Education Statistics
555 New Jersey Avenue NW
Washington, DC 20208

National Assessment of Educational Progress

The National Assessment of Educational Progress (NAEP) is a Congressionally mandated study funded by the Office of Educational Research and Improvement, U.S. Department of Education. The overall goal of the project is to determine the Nation's progress in education. To accomplish this goal, a cross-sectional study was designed and initially implemented in 1969. Each year, NAEP has gathered information about levels of educational achievement across the country. NAEP has surveyed the educational accomplishments of 9-, 13-, and 17-year-old students, and occasionally young adults, in 10 learning areas. Different learning areas were assessed annually and, as of 1980–81, biennially. Each area has been periodically reassessed in order to measure possible changes in education achievement.

The mathematics, reading, computer competency, literacy, and literature and U.S. history assessments presented in this publication were conducted by either the Education Commission of the States (1969–1983) or the Educational Testing Service (1983 to the present). NAEP in-school assessments were based on a deeply stratified three-stage sampling design. The first stage of sampling entails defining primary sampling units (PSU's)—typically counties, but sometimes aggregates of small counties; classifying the PSU's into strata defined by region and community type; and randomly selecting PSU's. For each age/grade level, the second stage entails enumerating, stratifying, and randomly selecting schools, both public and private, within each PSU selected at the first stage. The third stage involves randomly selecting students within a school for participation in NAEP to obtain a nationally representative sample by age and, beginning in 1983–84, by grade. Assessment exercises were administered either to individuals or small groups of students by specially trained personnel.

The literacy assessment data used in this report are based on a nationally representative household sample of 21- to 25-year-olds. Blacks and Hispanics were oversampled to allow samples of sufficient size for reliable results. A total of 38,400 households were screened to locate 4,494 potential respondents. (No more than one person was surveyed from any one household.) Of the potential respondents, 3,618 young adults participated, resulting in a response rate of 80 percent.

Information from NAEP is subject to both nonsampling and sampling error. Two possible sources of nonsampling error are nonparticipation and faulty instrumentation. The effects of nonparticipation are in some ways reduced through oversampling, although this does not assess the bias of nonparticipants. Instrumentation nonsampling error includes whether the NAEP assessment instruments measure what is being taught and in turn what is being learned by the students, ambiguous items or instructions, and insufficient time limits.

For further information on NAEP, contact:

Gary Phillips
Education Outcomes Division
National Center for Education Statistics
555 New Jersey Avenue NW
Washington, DC 20208

The Private School Survey

The 1983 Private School Survey was carried out in two parts, one based on a "list" frame and one based on an "area" frame. The area frame was used under the assumption that the lists available to NCES were not comprehensive and that list-building techniques applied to a sample of census areas would reveal some additional private schools. NCES started with the most complete list available, comprising some 21,000 schools, and updated it in 1983, based on review of new directories and other published sources. This effort resulted in a list of just under 27,000 schools. This frame was then stratified into 12 strata based on various combinations of religious affiliation and school level. A systematic sample of 1,320 schools was selected with probabilities equal to the square root of the enrollment of the school divided by the sum of the square roots of enrollment for all of the schools in the stratum. Inflating this sample provided an estimation universe, which was subsequently reduced by removing the estimated numbers of duplicates, nonrespondents, coding errors, and ineligibles. The final estimated list universe of schools was 21,710. The response rate for the list sample was 91 percent (1,074 of 1,176 schools), and the response rate for the area sample was 81 percent (733 of 901 schools).

For the area sample, the basic frame was a list of all counties reported from the 1980 census, adjusted so that independent cities were treated as counties and smaller counties were combined with other contiguous counties. This produced a list of 2,497 sampling units. These sampling units were stratified according to census region, in or out of a Metropolitan Statistical Area (MSA), and above or below the median private school enrollment for that region and MSA status, yielding 16 strata. The final sample was a systematic one comprising 75 sampling units, 8 of which were drawn with certainty based upon populations exceeding 1.7 million in the 1980 census. The remaining units were selected with probabilities proportionate to the square root of the population of the unit within the stratum.

For each of the sampling units in the area design, schools not overlapping with the list-frame schools were sought by reviewing directories of various types (e.g., private school organizations, telephone) and by telephoning officials, churches, chambers of commerce, and selected vendors, such as milk companies. This search produced 901 schools which met NCES criteria for functioning private schools. The survey and follow-up produced a response rate of 88 percent. When weighted, these data inflated to approximately 6,000 schools nationally. Since the area frame was designed not to overlap with the list frame, results for the area sample were combined with those for the list sample.

A follow-up survey was conducted in 1985. The schools within the sampling areas were drawn from the lists of schools created in the same sample areas from the "1983 Private School Survey." Since the lists were not updated, schools established after 1983 were not generally eligible for sampling. The estimates for the 1985–86 study are valid for schools that were in existence in 1983. Some of the estimates contain extrapolations for newly established schools, based on assumptions made

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contain extrapolations for newly established schools, based on assumptions made from the 1983 survey data.

To be included in the study, a school had to meet the following criteria: be privately administered, offer instruction at the first grade level or above, require attendance at least four hours per day and at least 160 days per year, and not be located in a private home used as a residence. Consequently, schools providing only kindergarten or pre-kindergarten instruction were not included in this study.

During the fall of 1985 the principal of each sampled school was contacted to obtain the school's participation in the study and to sample up to 10 teachers at the school. During January 1986, questionnaires were mailed to schools and teachers. Follow-up for questionnaire and item nonresponse was conducted during the spring of 1986. Imputations were made for item nonresponse. Of the 1,387 eligible schools, 1,174 responded (85 percent). A total of 5,295 teacher questionnaires were completed, for a teacher response rate of 76 percent.

Additional information is available from:

Jeffrey Williams
Elementary and Secondary Education Statistics Division
National Center for Education Statistics
555 New Jersey Avenue NW
Washington, DC 20208

Projections of Education Statistics

Since 1964, NCES has published *Projections of Education Statistics*, projecting for elementary and secondary schools and institutions of higher education key statistics including enrollments, instructional staff, graduates, and earned degrees. *Projections* includes several alternative projection series and a methodology section describing the techniques and assumptions used to prepare them. Data in this report reflect the intermediate *Projections* series only.

Differences between the reported and projected values are of course almost inevitable. An evaluation of past projections revealed that, at the elementary and secondary level, projections of enrollment have been quite accurate: mean absolute percentage differences for enrollment were less than 1 percent for projections from 1 to 5 years into the future, while those for teachers were less than 4 percent. At the higher education level, projections of enrollment have been fairly accurate: Mean absolute percentage differences were 5 percent or less for projections from 1 to 5 years into the future.

Since projections of time series are subject to errors both by the nature of statistics and the properties of projection methodologies, users are cautioned not to place too much confidence in the numerical values of the projections. Important but unforeseeable economic and social changes may lead to differences, particularly at the higher education level. Rather, projections are to be considered as indicators of broad trends.

For further information about projection methodology and accuracy, contact:

Debra E. Gerald
Condition of Education Division
National Center for Education Statistics
555 New Jersey Avenue NW
Washington, DC 20208

The Public School Survey

The 1985 Public School Survey was a mail sample survey conducted early in 1985, which collected information on a nationally representative sample of 2,801 public schools and 10,650 teachers. School information was collected from the school administrators of the sample schools and included data on enrollment, staffing, minority enrollment, advanced placement programs, use of aides and volunteers, use of computers, and use of incentive programs for teachers. Teacher information included data on training, experience, age, race/ethnicity, teaching salary, working hours, and additional employment.

The school sample was selected from the National Center for Education Statistics' Common Core of Data (CCD) universe of public elementary and secondary schools as follows: nine strata were defined, based on three categories of school type (elementary, secondary, and other) and three categories of school district size (1 to 5 schools; 6 to 50 schools; and more than 50 schools). The schools were selected independently within each stratum, with probability proportional to size. A school's size measure was defined as the square root of its full-time-equivalent number of teachers.

The teacher sample was selected according to a three-stage sampling design. The first stage sample consisted of the 2,801 schools. Lists of teachers were requested from all sampled schools. Each teacher within a sampled school was classified into one of three "teaching assignments" strata prior to the selection of sample teachers. The first of these strata consisted of general "Elementary" teachers, the second "Mathematics and Science" teachers, and the third of "Other" teachers. All teachers employed at those schools with four or fewer teachers were in the sample. A sample of four teachers was selected from each of the other cooperating sample schools according to a two-stage process which represented strata with probability proportional to size and teachers within strata with equal probability. A total of 10,650 sample teachers was selected.

The survey mailout began in February 1985 and continued into late spring. Questionnaire packets containing questionnaires for the school administrator and the selected teachers were addressed to the school administrator. Follow up efforts included additional mailings of questionnaires and telephone calls to nonrespondent administrators and teachers. The survey was closed out in June with a response rate of 84.6 percent for administrators and 80 percent for teachers.

For further information, contact:

Charles Hammer
Elementary and Secondary Education
  Statistics Division
National Center for Education Statistics
555 New Jersey Avenue NW
Washington, D.C. 20208

Recent College Graduates Survey

NCES has conducted periodic surveys to collect information on college outcomes. The "Recent College Graduates" surveys have concentrated on those graduates entering the teaching profession. To obtain accurate results on this subgroup, graduates who are newly qualified to teach have been oversampled in each of the surveys. The survey involves a two-stage sampling procedure. First, a sample of institutions awarding bachelor's and master's degrees is selected and stratified by percent of education graduates, control, and geographic region. Then for each of the selected institutions a sample of degree recipients is chosen. The response rates on the "Recent College Graduates" survey have tended to be low because of the great difficulty in tracing the students after graduation. Much more of the nonresponse can be attributed to invalid mailing addresses than to refusals to participate. Despite their shortcomings, the data are presented in this report because they provide valuable information not available elsewhere about college outcomes. Users should be cautious about drawing conclusions based on data from small samples. It is also likely that the data are somewhat biased since the more mobile students, such as graduate students, are the most difficult to track for the survey.

The 1976 survey of 1974–75 college graduates was the first and smallest of the series. The sample consisted of 209 schools, of which 200 (96 percent) responded. Of the 5,506 graduates in the sample, 4,350 responded for a response rate of 79 percent.

The 1981 survey was somewhat larger with a coverage of 301 institutions and 15,852 students. Responses were obtained from 286 institutions, for an institutional response rate of 95 percent, and from 9,312 graduates (716 others were determined to be out of scope), for a response rate of 62 percent.

The 1985 survey requested data from 18,738 students from 404 colleges. Responses were obtained from 13,200 students for a response rate of 74 percent (885 were out of scope). The response rate for the colleges was 98 percent. One major difference between this survey and the earlier ones was the timing of the survey in June. This had some effect on the data for teachers.

Further information on this survey may be obtained from:

Joanell Porter
Postsecondary Education Statistics Division
National Center for Education Statistics
555 New Jersey Avenue NW
Washington, DC 20208

School Discipline Policies and Practices Survey

Data reported in this survey were collected by means of a mail survey with telephone followup between October 1986 and January 1987. The survey was performed using the Fast Response Survey System (FRSS). FRSS was established by NCES to collect quickly, and with minimum burden on respondents, small quantities of data needed for educational planning and policy. The survey was designed to obtain the views of a nationally representative sample of public elementary and secondary school teachers on discipline problems in schools and to replicate certain questions asked on previous surveys of teachers and administrators.

In fall 1986 a two-stage stratified national sample of 1,547 teachers was selected to represent 1.9 million regular public school classroom teachers in the United States. In the first stage, 850 elementary and secondary schools were selected from the NCES 1984–85 listing of public schools. Schools were stratified by level and metropolitan status and then sequenced by geographic region and enrollment. Within each stratum, the specified number of schools was selected with a probability proportional to the number of FTE teachers. At the next stage, an average of two teachers from each school was randomly selected by telephone from lists of teachers provided by the school. Questionnaires were mailed to the selected teachers in late October of 1986, and telephone followup continued through January of 1987. A 98 percent school participation rate and a 88 percent teacher participation rate were attained, for an overall response rate of 86 percent. Responses were adjusted for nonresponse and weighted to national totals.

Since the estimates were obtained from a sample of teachers, they are subject to sampling variability. Estimates of standard errors were computed using a jackknife replication technique.

The survey estimates are also subject to nonsampling error from such sources as differences in interpretation of the meaning of the questions by the respondents, differences related to the particular time the survey was conducted, or errors in sampling or data preparation. During the design of the survey and survey pretest, an effort was made to check for consistency of interpretation of questions and to eliminate ambiguous items. Manual and machine editing of the forms were conducted to check the data for accuracy and consistency. For those items that involved inconsistencies or omissions, clarification was obtained by telephone.

For more information about this survey contact:

Helen Ashwick
Education Outcomes Division
National Center for Education Statistics
555 New Jersey Avenue NW
Washington, DC 20208

National Institute on Drug Abuse
U.S. Department of Health and Human Services

The National Institute on Drug Abuse is the primary supporter of the long-term study entitled "Monitoring the Future: A Continuing Study of the Lifestyles and Values of Youth," conducted at the University of Michigan, Institute for Social Research. One component of the study deals with student drug abuse. Results of a national sample survey have been published annually since 1975. Approximately 125 to 135 schools have participated each year. With the exception of 1975 when about 9,400 students participated in the survey, more than 15,000 students have participated in the survey annually. For the class of 1987, about 16,300 students responded to the survey. Over the years, the response rate has varied from 77 to 84 percent.

The data in this survey represent only high school seniors. Understandably, there will be some reluctance to admit illegal activities. Also, students who were out of school on the day of the survey were nonrespondents. The survey did not include high school dropouts. The inclusion of these two groups would tend to increase the proportion of individuals who had used drugs. A 1983 study found that the inclusion of the absentees could increase some of the drug usage estimates by as much as 2.7 percent. (Details on that study and its methodology were published in *Drug Use Among American High School Students, College Students, and Other Young Adults*, by Lloyd D. Johnston, Patrick M. O'Malley, and Jerald G. Bachman, available from the National Clearinghouse on Drug Abuse Information, 5600 Fishers Lane, Rockville, MD 20857.)

Further information on this survey may be obtained from:

National Institute on Drug Abuse
Division of Epidemiology and Statistical Analysis
5600 Fishers Lane
Rockville, MD 20857

National Science Foundation

Federal Obligations to Colleges and Universities and Selected Nonprofit Institutions

Each year the National Science Foundation collects data on obligations to colleges and universities from Federal agencies. Obligations differ from expenditures in that funds obligated during one fiscal year may be spent by the recipient in later years. The fiscal year 1990 data were submitted by 12 Federal agencies. Obligation amounts include direct Federal support, so that amounts subcontracted to other institutions are included. Those funds received through subcontracts are excluded. Also excluded from the data are certain types of financial assistance such as the Department of Education's Guaranteed Student Loan Program and obligations to the U.S. service academies. For purposes of tabulations in this publication, university-administered federally funded research and development centers (FFRDC's) have been included in appropriate State totals.

The universe of academic institutions for this survey is based on the Higher Education General Information Survey conducted by the National Center for Education Statistics (see above). Institutions without Federal support were excluded and some systems were combined into single reporting units.

Further information on this survey may be obtained from *Federal Support to*

Universities, Colleges, and Selected Nonprofit Institutions, published by the National Science Foundation or by contacting:

Universities and Nonprofit Institutions Study Group
Division of Science Resources Studies
National Science Foundation, Room L-602
Washington, DC 20550

National Survey of Science and Mathematics Education

This survey, conducted from November 1985 through May 1986, involved a national probability sample of schools, principals, and teachers in grades K through 12. The sample was designed so that national estimates of teacher preparation, course offerings and enrollments, and classroom practices could be made from the sample data. The sample design also ensured that estimates could be made from various subpopulations such as those in a particular region or a particular type of community.

A probability sample requires that every member of the population being sampled have a positive chance of being selected. The sample design for this survey ensured that every principal or headmaster and teacher of mathematics and/or science in grades K–12 in the 50 states and the District of Columbia had a chance of being selected.

This study used a two-stage probability sampling design with schools as the first stage sampling units and teachers as the second stage units. In the first sampling stage, three independent grade-specific probability samples of 425 schools were selected with probability proportional to size. Schools were classified according to whether they contained grades K through 6, grades 7 through 9, or grades 10 through 12; schools containing grades spanning two or more of the grade ranges were eligible to be selected for multiple samples. Data reported in *The Condition of Education* are limited to schools containing at least one of grades 10 through 12. The selection of sample schools required the construction of three grade-range specific sampling frames, the computation of a size measure for each school, and stratification of schools in each sampling frame.

The results of this survey are subject to both sampling error and nonsampling error. To help control nonsampling error, the survey instruments were revised based on feedback from various reviewers, field tested, and revised again. There were several iterations of field testing and revision, to ensure that individual items were clear and unambiguous.

In September of 1985, a description of the survey was sent to the principal of each sample school. Telephone followups were used to obtain information from nonresponding schools. Due to school closings and mergers, 37 schools were identified as ineligible. Initial data were obtained from 1,108 of the remaining 1,248 sample schools, for a response rate of 89 percent. The final response rate for principals, after repeated mail and telephone contacts with nonrespondents, and excluding ineligibles, was 96 percent.

All population estimates from this survey presented in this report were computed using weighted data. The weight for each respondent was calculated as the inverse of the probability of selecting the individual into the sample multiplied by a nonresponse adjustment factor based upon the urbanicity of the school.

For more information contact:

Research Triangle Institute
P.O. Box 12194
Research Triangle Park, NC 27709-2194

Scientific and Engineering Expenditures at Universities and Colleges Survey

The universe for this survey included 563 institutions in the United States and outlying areas that had a master's or doctor's degree program in the sciences or engineering. In addition, schools that had $50,000 or more in separately budgeted research and development expenditures and 18 federally funded research and development centers were included. Altogether, these institutions represented approximately 98 percent of all college and university research and development.

The survey instrument has remained essentially unchanged in recent years to facilitate consistent responses. The field of study details match the standard field codes in the *Classification of Instructional Programs*, published by NCES. The response rate for the 1992 survey was 91 percent. The remaining institutions were imputed. The imputation amounted to only 3 percent of the total expenditures reported, since the nonrespondents tended to be smaller institutions. The survey process included a verification procedure in which trend data for the past two reports and the current survey were sent to each institution. The institutions were given an opportunity to amend the current and past figures. These revisions have been incorporated in the National Science Foundation data base.

Further information on this survey may be obtained from *Academic Science/Engineering, R&D Funds*, published by the National Science Foundation, or by contacting:

Universities and Nonprofit Institutions Study Group
Division of Science Resources Studies
National Science Foundation, Room L-602
Washington, DC 20550

Survey of Earned Doctorates

The Survey of Earned Doctorates (SED) has been conducted annually by the National Academy of Sciences for the National Science Foundation, the Department of Education, and other Federal agencies since 1957. Information from the survey becomes part of the Doctorate Records File, which includes records for doctorates awarded since 1920 by regionally accredited universities and colleges. The universe consists of all recipients of doctoral degrees such as Ph.D. or D.Sc., but excludes the recipients of first-professional degrees such as the J.D. or M.D.. Approximately 95 percent of the annual cohort of doctorate recipients have responded to the questionnaire which is distributed through the cooperation of the Graduate Deans. Partial data from public sources are added to the file for nonrespondents. The data for a given year include all doctorates awarded in the 12-month period ending on June 30 of that year.

Data for the SED are collected directly from individual doctorate recipients. In addition to the field and specialty of the degree, the recipient is asked to provide educational history, selected demographic data, and information on postgraduate work and study plans. The National Center for Education Statistics' survey of earned degrees, part of its Higher Education General Information Survey (HEGIS), collects data from institutions, not individuals. Therefore, the number of doctorates reported in SED differs slightly from HEGIS totals. Also, SED data are restricted to research doctorates. The differences between the two data series have been generally consistent since 1960. The ratio of NCES/NSF totals for all Ph.D.s has ranged from 1.01 to 1.06.

Further information on this survey can be obtained from *Science and Engineering Doctorates: 1960–86*, published by the National Science Foundation, or by contacting:

Science and Engineering Education Sector Studies Group
Division of Science Resources Studies
National Science Foundation
Washington, DC 20550

The Office of Special Education and Rehabilitative Services
U.S. Department of Education

Annual Report to Congress on the Implementation of the Education of the Handicapped Act

The Education of the Handicapped Act (EHA) requires the Secretary of Education to transmit to Congress annually a report describing the progress in serving the Nation's handicapped children. The annual report contains information on such children served by the public schools under the provisions of Part B of the EHA and for children served in State operated programs (SOP) for the handicapped under Chapter I of the Education Consolidation and Improvement Act (ECIA). Statistics on children receiving special education and related services in various settings and school personnel providing such services are reported in an annual submission of data to the Office of Special Education and Rehabilitative Services (OSERS) by the 50 States, the District of Columbia, and the outlying areas. The child count information is based on the number of handicapped children receiving special education and related services on December 1st of each year for EHA and October 1st for Chapter I of ECIA/SOP.

Since each participant in programs for the handicapped is reported to OSERS, the data are not subject to sampling error. However, nonsampling error can occur from a variety of sources. Some States follow a noncategorical approach to the delivery of special education services but produce counts by handicapping condition only because EHA-B requires it. In those States that do categorize their handicapped students, definitions and labeling practices vary. In each case, even though States must use the Federal definitions of the handicapping categories for reporting purposes, there is no way to judge the accuracy of these States' relabeling of their students for the Federal count. Some States also have reported combined counts for some of the smaller categories of handicap.

These variations in labeling practices may help explain why there have been inconsistencies both year to year within a given State and from State to State in the ways in which students with more than one handicapping condition have been categorized. However, Federal and State efforts to ensure that children are being classified and reported appropriately and efforts to achieve greater consistency in classification and reporting among States help minimize these variations.

Further information on the Annual Report to Congress may be obtained from:

Lou Danielson
Office of Special Education and Rehabilitative Services
Office of Special Education Programs
330 C Street SW
Washington, DC 20202

2. Private Research and Professional Associations

American College Testing Program

The American College Testing (ACT) Assessment is designed to measure educational development in the areas of English, mathematics, social studies, and natural sciences. The ACT Assessment is taken by college-bound high school students and the test results are used to predict how well students might perform in college.

Prior to the 1984–85 school year, national norms were based on a 10 percent sample of the students taking the test. Since then, national norms are based on the test scores of all students taking the test. Moreover, beginning with 1984–85 these norms have been based on the most recent ACT scores available from students scheduled to graduate in the spring of the year. Duplicate test records are no longer used to produce national figures.

Separate ACT standard scores are computed for English, mathematics, social studies, and natural science. Standard scores are reported for each subject area on a scale from 1 to 36. The four scores have a mean (average) of about 19 and a standard deviation of about 6 for college-bound students nationally. The simple average of the four standard scores gives a composite score, an indication of student's overall academic development across these subject areas.

It should be noted that college-bound students who take the ACT Assessment are not representative in some respects of college-bound students nationally. First, students who live in the Midwest, Rocky Mountains and Plains, and the South are overrepresented among ACT-tested students as compared with college-bound students nationally. Second, ACT-tested students tend to enroll in public colleges and universities more frequently than do college-bound students nationally.

For further information, contact:

The American College Testing Program
2201 North Dodge Street
P.O. Box 168
Iowa City, IA 52243

College Entrance Examination Board

The Admissions Testing Program of the College Board comprises a number of college admissions tests, including the Preliminary Scholastic Aptitude Test (PSAT) and the Scholastic Aptitude Test (SAT). High school students participate in the testing program as sophomores, juniors, or seniors—some more than once during these 3 years. If they have taken the tests more than once, only the most recent scores are tabulated. The PSAT and SAT report subscores in the areas of mathematics and verbal ability.

SAT results do not represent high school or college-bound students nationally since the sample is self-selected. Generally tests are taken by students who need the results to attend a particular college or university. State totals are greatly affected by requirements of State colleges. Public colleges in some States require ACT rather than SAT scores. Thus the proportion of students taking the SAT in these States is very low and is inappropriate for any comparison. In recent years about 1 million high school students have taken the examination annually.

Further information on the SAT can be obtained from:

College Entrance Examination Board
Educational Testing Service
Princeton, NJ 08541

Education Commission of the States

The Education Commission of the States (ECS) Clearinghouse researches and collects data on laws and standards in the field of education and reports them periodically in "Clearinghouse Notes". They collect information about administrators, principals, and teachers. They also examine policy areas, such as assessment and testing, collective bargaining, early childhood issues, quality education, and school schedules. The information is collected by reading State newsletters, tracking State legislation, and surveying the State Education Agencies. Data are verified by the individual States when necessary. Even though ECS monitors State activity on a continuous basis, they update the data only when there is significant change in State activity.

Further information is available from:

Melody Bush or Chris Pipho
Education Commission of the States
1860 Lincoln Street, Suite 300
Denver, CO 80295

Gallup Poll

Each year the Gallup Poll conducts the "Public Attitudes Toward the Public Schools" survey, funded by Phi Delta Kappa. The survey includes interviews with approximately 1,600 adults representing the civilian noninstitutional population 18 years old and over.

The sample used in the 19th annual survey was made up of a total of 1,571 respondents and is described as a modified probability sample of the Nation. Personal, in-home interviewing was conducted in representative areas of the Nation and types of communities. Approximately 69 percent of the respondents had no children in school, 27 percent were parents of children in public schools, and 6 percent had children attending nonpublic schools. This total is greater than 100 percent because some parents had children attending both public and nonpublic schools.

The survey is a sample survey and is subject to sampling error. The size of error depends largely on the number of respondents providing data. For example, an estimated percentage of about 10 percent based on the responses of 1,000 sample members has an approximate sampling error of 2 percent at the 95 percent confidence level. The sampling error for the difference in two percentages (50 percent versus 41 percent) based on two samples of 750 members and 400 members, respectively, is about 8 percent.

Further information on this survey can be obtained from:

Gallup Poll
Phi Delta Kappa
P.O. Box 789
Bloomington, IN 47402-0789

Metropolitan Life Insurance Company

The 1987 "Metropolitan Life Survey of the American Teacher" was conducted by Louis Harris and Associates for Metropolitan Life Insurance Company. A total of 1,002 telephone interviews were conducted during May and June, 1987. The teachers came from all types of public schools throughout the United States, but the population excludes those teachers without a telephone.

The survey sample was drawn at random from a list of 1.2 million current teachers compiled by Market Data Retrieval, a market research company that compiles mailing lists of schools and school districts. Sample sizes for completed interviews were set for each State, based on the proportion of elementary and secondary public school classroom teachers in the State. The State sample sizes were based on statistics published by the National Center for Education Statistics.

Each selected current teacher was contacted at his or her school and requested to participate in the survey. Thirty-one percent of the teachers contacted or with whom a message was left participated in the survey. Of the teachers who were successfully contacted by Louis Harris and Associates and who were eligible to participate in the survey, 84 percent completed the interview. While the "interview completion rate" is just as high as or higher than in previous survey years, the "contact success rate" is lower than the typical 50 percent level experienced in past years.

For the first time, the 1987 survey sought the views of parents of public school children. Telephone interviews were conducted with 2,011 randomly selected parents across the nation during May and June, 1987. Approximately 9,000 households were screened in order to obtain the required sample size. The overall completion rate for the survey was 75 percent of the eligible households reached.

The parent survey was based on a sample of the civilian population of the continental United States. The sample was stratified by geographic region and metropolitan versus nonmetropolitan residence. Households were selected via random-digit-dialing procedures and excluded those households without telephones.

Further information on this survey may be obtained from:

Metropolitan Life Survey of the American Teacher
Metropolitan Life Insurance Company
One Madison Avenue
New York, NY 10010

National Education Association

Estimates of School Statistics

The National Education Association (NEA) reports revenues and expenditure data in its annual publication, *Estimates of School Statistics*. Each year NEA prepares regression-based estimates of financial and other education statistics and submits them to the States for verification. Generally about 30 States adjust these estimates based on their own data. These preliminary data are published by NEA along with revised data from previous years. States are asked to revise previously submitted data as final figures become available. The most recent publication contains all changes reported to the NEA.

Some tables herein use revised estimates of financial data prepared by NEA because it was the most current source. Since expenditure data reported to NCES must be certified for use in Department of Education formula grant programs (such as Chapter I of the Education Consolidation and Improvement Act), NCES data are not available as soon as NEA estimates.

Further information on can be obtained from:

National Education Association—Research
1201 16th Street NW
Washington, DC 20036

Teacher Opinion Polls

Results from surveys of teachers conducted between 1980 and 1982 by the National Education Association were based on a two-stage probability sample of about 2,000 teachers randomly selected from lists of teachers provided by school districts. Response rates for the years included in this publication ranged from 75 percent to 80 percent. The standard errors for the population estimates were reported to be less than 3 percent. Differences of 5 percent or more between percentages were reported as significant at the 95 percent level.

For more details on methodology, see "Nationwide Teacher Opinion Poll, 1980," Bernard Bartholow, Washington, D.C.

Status of the American Public School Teacher

The "Status of the American Public School Teacher" survey is conducted every 5 years by the National Education Association (NEA). The survey was designed by the NEA Research Division and initially administered in 1956. The intent of the survey is to solicit information covering various aspects of public school teachers' professional, family, and civic lives.

Participants for the survey are selected using a two-stage sample design, with the first-stage stratum determined by the number of students enrolled in the districts. Selection probabilities are determined so that the resulting sample is self-weighting. In 1985–86, a sample of 1,784 was selected from the approximately 2,200,000 public school teachers, and 1,291 usable replies were obtained, yielding a response rate of 72.4 percent.

Possible sources of nonsampling errors are nonresponses, misinterpretation, and—when comparing data over years—changes in the sampling method and instrument. Misinterpretation of the survey items should be minimal, as the sample responding is not from the general population but one knowledgeable about the area of concern. Since the sampling procedure changed after 1956, and some wording of items has changed over the different administrations, care is taken to present only comparable data.

Since sampling is used, sampling variability is inherent in the data. An approximation to the maximum standard error for estimating the population percentages is 1.4 percent. To estimate the 90 percent confidence interval for population percentage, the maximum standard error of 1.4 percent is multiplied by 1.65 (1.4 percent × 1.65). The resulting percentage (2.3 percent) is added and subtracted from the population estimate to establish upper and lower bounds for the confidence interval. For example, if a sample percentage is 60 percent, there is a 90 percent chance that the population percentage lies between 57.7 percent and 62.3 percent (60 percent ± 2.3 percent).

Questions concerning the "Status of the American Public School Teacher" survey may be directed to:

National Education Association
Research Division
1201 16th Street NW
Washington, DC 20036

Academic support: This category of college expenditures includes expenditures for support services that are an integral part of the institution's primary missions of instruction, research, or public service. Includes expenditures for libraries, galleries, audio/visual services, academic computing support, ancillary support, academic administration, personnel development, and course and curriculum development.

Agriculture: Courses designed to improve competencies in agricultural occupations. Included is the study of agricultural production, supplies, mechanization and products, agricultural science, forestry, and related services.

American College Testing Program (ACT): The ACT assessment program measures educational development and readiness to pursue college-level coursework in English, mathematics, natural science, and social studies.

Appropriation (institutional revenues): An amount (other than a grant or contract) received from or made available to an institution through an act of a legislative body.

Associate degree: A degree granted for the successful completion of a subbaccalaureate program of studies, usually requiring at least 2 years (or equivalent) of full-time college-level study. This includes degrees granted in a cooperative or work/study program.

Auxiliary enterprises: This category includes those essentially self-supporting operations which exist to furnish a service to students, faculty, or staff, and which charge a fee that is directly related to, although not necessarily equal to, the cost of the service. Examples are residence halls, food services, college stores, and intercollegiate athletics.

Average daily attendance (ADA): The aggregate attendance of a school during a reporting period (normally a school year) divided by the number of days school is in session during this period. Only days on which the pupils are under the guidance and direction of teachers should be considered days in session.

Average daily membership (ADM): The aggregate membership of a school during a reporting period (normally a school year) divided by the number of days school is in session during this period. Only days on which the pupils are under the guidance and direction of teachers should be considered as days in session. The average daily membership for groups of schools having varying lengths of terms is the average of the average daily memberships obtained for the individual schools.

Bachelor's degree: A degree granted for the successful completion of a baccalaureate program of studies, usually requiring at least 4 years (or equivalent) of full-time college-level study. This includes degrees granted in a cooperative or work-study program.

Business and management: Instructional programs that describe the processes of purchasing, selling, producing, and interchanging of goods, commodities, and services in profit-making and nonprofit public and private institutions and agencies.

Carnegie unit: A standard of measurement that represents one credit for the completion of a 1-year course.

Catholic school: (See Orientation)

Class size: The membership of a class at a given date.

Cohort: A group of individuals who have a statistical factor in common, for example, year of birth.

College: A postsecondary school which offers general or liberal arts education, usually leading to an associate, bachelor's, master's, doctor's, or first-professional degree. Junior colleges and community colleges are included under this terminology.

Combined elementary and secondary school: A school which encompasses instruction at both the elementary and the secondary levels. Examples of combined elementary and secondary school grade spans would be 1 through 12 or 5 through 12.

Computer sciences: A group of instructional programs that describes computer and information sciences, including computer programming, data processing, and information systems.

Constant dollars: Dollar amounts that have been adjusted by means of price and cost indexes to eliminate inflationary factors and allow direct comparison across years.

Control of institutions: A classification of institutions of higher education by whether the institution is operated by publicly elected or appointed officials (public control) or by privately elected or appointed officials and derives its major source of funds from private sources (private control).

Consumer, personal, and miscellaneous services. A group of instructional programs that describes the fundamental skills a person is normally thought to need in order to function productively in society. Some examples are child development, consumer education, and family relations.

Consumer price index (CPI). This price index measures the average change in the cost of a fixed market basket of goods and services purchased by consumers.

Current dollars. Dollar amounts that have not been adjusted to compensate for inflation.

Current expenditures (elementary/secondary). The expenditures for operating local public schools excluding capital outlay and interest on school debt. These expenditures include such items as salaries for school personnel, fixed charges, student transportation, school books and materials, and energy costs. Beginning in 1980-81, expenditures for State administration are excluded.

Current expenditures per pupil in average daily attendance. Current expenditures for the regular school term divided by the average daily attendance of full-time pupils (or full-time equivalency of pupils) during the term. See also Current expenditures and Average daily attendance.

Current-fund expenditures (higher education). Money spent to meet current operating costs, including salaries, wages, utilities, student services, public services, research libraries, scholarships and fellowships, auxiliary enterprises, hospitals, and independent operations. Excludes loans, capital expenditures, and investments.

Current-fund revenues (higher education). Money received during the current fiscal year from revenue which can be used to pay obligations currently due, and surpluses reappropriated for the current fiscal year.

Doctor's degree. An earned degree carrying the title of Doctor. The Doctor of Philosophy degree (Ph.D.) is the highest academic degree and requires mastery within a field of knowledge and demonstrated ability to perform scholarly research. Other doctorates are awarded for fulfilling specialized requirements in professional fields, such as education (Ed.D.), musical arts (D.M.A.), business administration (D.B.A.), and engineering (D.Eng. or D.E.S.). Many doctor's degrees in both academic and professional fields require an earned master's degree as a prerequisite. First-professional degrees, such as M.D. and D.D.S., are not included under this heading.

Educational attainment: The highest grade of regular school attended and completed.

Educational and general expenditures: The sum of current funds expenditures on instruction, research, public service, academic support, student services, institutional support, operation and maintenance of plant, and awards from restricted and unrestricted funds.

Elementary school: A school classified as elementary by State and local practice and composed of any span of grades not above grade 8. A preschool or kindergarten school is included under this heading only if it is an integral part of an elementary school or a regularly established school system.

Elementary/secondary school: As reported in this publication, includes only regular schools, i.e., schools that are part of State and local school systems, and also most not-for-profit private elementary/secondary schools, both religiously affiliated and nonsectarian. Schools not reported include subcollegiate departments of institutions of higher education, residential schools for exceptional children, Federal schools for Indians, and Federal schools on military posts and other Federal installations.

Engineering and engineering technologies: Instructional programs that describe the mathematical and natural sciences gained by study, experience, and practice and applied with judgment to develop ways to utilize economically the materials and forces of nature for the benefit of mankind. Includes programs that prepare individuals to support and assist engineers and similar professionals.

English: A group of instructional programs that describes the English language arts, including composition, creative writing, and the study of literature.

Enrollment: The total number of students registered in a given school unit at a given time, generally in the fall of a year.

Expenditures: Charges incurred, whether paid or unpaid, which are presumed to benefit the current fiscal year. For elementary/secondary schools, these include all charges for current outlays plus capital outlays and interest on school debt. For institutions of higher education, these include current outlays plus capital outlays. For government, these include charges net of recoveries and other correcting transactions other than for retirement of debt, investment in securities, extension of credit, or as agency transactions. Government expenditures include only external transactions, such as the provision of perquisites or other payments in kind. Aggregates for groups of governments exclude intergovernmental transactions among the governments.

[illegible]

Expenditures per pupil Charges incurred for a particular period of time divided by a student unit of measure, such as average daily attendance or average daily membership.

First-professional degree A degree that signifies both completion of the academic requirements for beginning practice in a given profession and a level of professional skill beyond that normally required for a bachelor's degree. This degree usually is based on a program requiring at least 2 academic years of work prior to entrance and a total of at least 6 academic years of work to complete the degree program, including both prior required college work and the professional program itself. By NCES definition, first-professional degrees are awarded in the fields of dentistry (D.D.S. or D.M.D.), medicine (M.D.), optometry (O.D.), osteopathic medicine (D.O.), pharmacy (D.Phar.), podiatric medicine (D.P.M.), veterinary medicine (D.V.M.), chiropractic (D.C. or D.C.M.), law (J.D.), and theological professions (M.Div. or M.H.L.).

Fiscal year The yearly accounting period for the Federal Government, which begins on October 1 and ends on the following September 30. The fiscal year is designated by the calendar year in which it ends; e.g., fiscal year 1998 begins on October 1, 1997 and ends on September 30, 1998. (From fiscal year 1844 to fiscal year 1976 the fiscal year began on July 1 and ended on the following June 30.)

Foreign languages A group of instructional programs that describes the structure and use of language that is common or indigenous to people of the same community or nation, the same geographical area, or the same cultural traditions. Programs cover such features as sound, literature, syntax, phonology, semantics, sentences, prose, and verse, as well as the development of skills and attitudes used in communicating and evaluating thoughts and feelings through oral and written language.

Full-time-equivalent (FTE) enrollment For institutions of higher education, enrollment of full-time students, plus the full-time equivalent of part-time students as reported by institutions. In the absence of an equivalent reported by an institution, the FTE enrollment is estimated by adding one-third of part-time enrollment to full-time enrollment.

Full-time instructional faculty Those members of the instruction/research staff who are employed full-time as defined by the institution, including faculty with released time for research and faculty on sabbatical leave. Full-time counts exclude faculty who are employed to teach less than two semesters, three quarters, two trimesters, or two 4-month sessions; replacements for faculty on sabbatical leave or those on leave without pay; faculty for preclinical and clinical medicine;

faculty who are donating their services; faculty who are members of military organizations and paid on a different pay scale from civilian employees; academic officers, whose primary duties are administrative; and graduate students who assist in the instruction of courses.

Full-time enrollment: The number of students enrolled in higher education courses with total credit load equal to at least 75 percent of the normal full-time course load.

Full-time worker: In educational institutions, an employee whose position requires being on the job on school days throughout the school year at least the number of hours the schools are in session. For higher education, a member of an educational institution's staff who is employed full-time.

General educational development (GED) test: A test administered by the American Council on Education as the basis for awarding a high school equivalent certification.

General program: A program of studies designed to prepare students for the common activities of a citizen, family member, and worker. A general program of studies may include instruction in both academic and vocational areas.

Geographic region: One of four regions used by the Bureau of the Economic Analysis of the U.S. Department of Commerce, the National Assessment of Educational Progress, and the National Education Association, as follows: (The National Education Association designated the Central region as Middle region in its classification.)

Northeast

Connecticut
Delaware
District of Columbia
Maine
Maryland
Massachusetts
New Hampshire
New Jersey
New York
Pennsylvania
Rhode Island
Vermont

Southeast

Alabama
Arkansas
Florida
Georgia
Kentucky
Louisiana
Mississippi
North Carolina
South Carolina
Tennessee
Virginia
West Virginia

Central (Middle)

Illinois
Indiana
Iowa
Kansas
Michigan
Minnesota
Missouri
Nebraska
North Dakota
Ohio
South Dakota
Wisconsin

West

Alaska
Arizona
California
Colorado
Hawaii
Idaho
Montana
Nevada
New Mexico
Oklahoma
Oregon
Texas
Utah
Washington
Wyoming

Government appropriation: An amount (other than a grant or contract) received from or made available to an institution through an act of a legislative body.

Government grant or contract: Revenues from a government agency for a specific research project or other program.

Graduate enrollment: The number of students who hold the bachelor's or first-professional degree, or the equivalent, and who are working towards a master's or doctor's degree. First-professional students are counted separately. These enrollment data measure those students who are registered at a particular time during the fall. At some institutions, graduate enrollment also includes students who are in postbaccalaureate classes but not in degree programs.

Graduate Record Examination (GRE): Multiple-choice examinations administered by the Educational Testing Service and taken by college students who are intending to attend certain graduate schools. The tests are offered in a variety of subject areas. Ordinarily, a student will take only the exam that applies to the intended field of study.

Graduate student: A student who holds a bachelor's or first-professional degree, or equivalent, and is taking courses at the post-baccalaureate level. These students may or may not be enrolled in graduate programs.

Gross national product (GNP): The total national output of goods and services valued at market prices. GNP can be viewed in terms of expenditure categories which include purchases of goods and services by consumers and government, gross private domestic investment, and net exports of goods and services. The goods and services included are largely those bought for final use (excluding illegal transactions) in the market economy. A number of inclusions, however, represent imputed values, the most important of which is rental value of owner-occupied housing. GNP, in this broad context, measures the output attributable to the factors of production—labor and property—supplied by U.S. residents.

Handicapped: Those children evaluated by the States as having any of the following impairments, who because of these impairments need special education and related services. (These definitions apply specifically to data from the U.S. Office of Special Education and Rehabilitative Services presented in this publication.)

> **Deaf**: Having a hearing impairment which is so severe that the student is impaired in processing linguistic information through hearing (with or without amplification) and which adversely affects educational performance.

Deaf-blind: Having concomitant hearing and visual impairments which cause such severe communication and other developmental and educational problems that the student cannot be accommodated in special education programs solely for deaf or blind students.

Hard of hearing: Having a hearing impairment, whether permanent or fluctuating, which adversely affects the student's educational performance but which is not included under the definition of "deaf" in this section.

Mentally retarded: Having significantly subaverage general intellectual functioning, existing concurrently with deficits in adaptive behavior and manifested during the developmental period, which adversely affects the child's educational performance.

Multihandicapped: Having concomitant impairments (such as mentally retarded-blind, mentally retarded-orthopedically impaired, etc.), the combination of which causes such severe educational problems that the student cannot be accommodated in special education programs solely for one of the impairments. Term does not include deaf-blind students but does include those students who are severely or profoundly mentally retarded.

Orthopedically impaired: Having a severe orthopedic impairment which adversely affects a student's educational performance. The term includes impairment resulting from congenital anomaly, disease, or other causes.

Other health impaired: Having limited strength, vitality, or alertness – due to chronic or acute health problems such as a heart condition, tuberculosis, rheumatic fever, nephritis, asthma, sickle cell anemia, hemophilia, epilepsy, lead poisoning, leukemia, or diabetes – which adversely affects the student's educational performance.

Seriously emotionally disturbed: Exhibiting one or more of the following characteristics over a long period of time, to a marked degree, and adversely affecting educational performance: an inability to learn which cannot be explained by intellectual, sensory, or health factors; an inability to build or maintain satisfactory interpersonal relationships with peers and teachers; inappropriate types of behavior or feelings under normal circumstances; a general pervasive mood of unhappiness or depression; or a tendency to develop physical symptoms or fears associated with personal or school problems. This term does not include children who are socially maladjusted, unless they also display one or more of the listed characteristics.

Specific learning disabled: Having a disorder in one or more of the basic psychological processes involved in understanding or in using spoken or written language, which may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations. The term includes such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, and developmental asphasia. The term does not include children who have learning problems which are primarily the result of visual, hearing, or environmental, cultural, or economic disadvantage.

Speech impaired: Having a communication disorder, such as stuttering, impaired articulation, language impairment, or voice impairment, which adversely affects the student's educational performance.

Visually handicapped: Having a visual impairment which, even with correction, adversely affects the student's educational performance. The term includes partially seeing and blind children.

Higher education: Study beyond secondary school at an institution that offers programs terminating in an associate, baccalaureate, or higher degree.

Higher education institutions (general definition): Institutions providing education above the instructional level of the secondary schools, usually beginning with grade 13. Typically, these institutions include colleges, universities, graduate schools, professional schools, and other degree-granting institutions.

Higher education institutions (traditional classification):

4-year institution: An institution legally authorized to offer and offering at least a 4-year program of college-level studies wholly or principally creditable toward a baccalaureate degree. In some tables a further division between universities and other 4-year institutions is made. A "university" is a postsecondary institution which typically comprises one or more graduate professional schools (also see *University*).

2-year institution: An institution legally authorized to offer and offering at least a 2-year program of college-level studies which terminates in an associate degree or is principally creditable toward a baccalaureate degree.

High school: A secondary school offering the final years of high school work necessary for graduation, usually including grades 10, 11, 12 (in a 6-3-3 plan) or grades 9, 10, 11, and 12 (in a 6-2-4 plan).

High school program: A program of studies designed to prepare students for their postsecondary education and occupation. Three types of programs are usually distinguished—academic, vocational, and general. An academic program is designed to prepare students for continued study at a college or university. A vocational program is designed to prepare students for employment in one or more semiskilled, skilled, or technical occupations. A general program is designed to provide students with the understanding and competence to function effectively in a free society and usually represents a mixture of academic and vocational components.

Humanities: Instructional programs in the following fields: area and ethnic studies, foreign languages, letters, liberal/general studies, multi/interdisciplinary studies, philosophy and religion, theology, and the visual and performing arts.

Independent operations: A group of self-supporting activities under control of a college or university. For purposes of financial surveys conducted by the Center for Education Statistics, this category is composed principally of Federally Funded Research and Development Centers (FFRDC).

Inflation: An upward movement in general price levels that results in a decline of purchasing power.

Institutional support: The category of higher education expenditures that includes day-to-day operational support for colleges, excluding expenditures for physical plant operations. Examples of institutional support include general administrative services, executive direction and planning, legal and fiscal operations, and community relations.

Instruction: That category including expenditures of the colleges, schools, departments, and other instructional divisions of higher education institutions and expenditures for departmental research and public service which are not separately budgeted. Includes expenditures for both credit and noncredit activities. Excludes expenditures for academic administration where the primary function is administration (e.g., academic deans).

Instructional staff: Full-time-equivalent number of positions, not the number of different individuals occupying the positions during the school year. In local schools includes all public elementary and secondary (junior and senior high) day-school positions that are in the nature of teaching or in the improvement of the teaching-learning situation. Includes consultants or supervisors of instruction, principals, teachers, guidance personnel, librarians, psychological personnel, and other instructional staff. Excludes administrative staff, attendance personnel, clerical personnel, and junior college staff.

Junior high school: A separately organized and administered secondary school intermediate between the elementary and senior high schools, usually including grades 7, 8, and 9 (in a 6-3-3 plan) or grades 7 and 8 (in a 6-2-4 plan).

Labor force: Persons employed as civilians, unemployed, or in the armed services during the survey week. The "civilian labor force" comprises all civilians classified as employed or unemployed.

Local education agency: See *School district*.

Mandatory transfer: A transfer of current funds that must be made in order to fulfill a binding legal obligation of the institution. Included under mandatory transfers are debt service provisions relating to academic and administrative buildings, including (1) amounts set aside for debt retirement and interest and (2) required provisions for renewal and replacement of buildings to the extent these are not financed from other funds.

Master's degree: A degree awarded for successful completion of a program generally requiring 1 or 2 years of full-time college-level study beyond the bachelor's degree. One type of master's degree including the Master of Arts degree, or M.A., and the Master of Science degree, or M.S., is awarded in the liberal arts and sciences for advanced scholarship in a subject field or discipline and demonstrated ability to perform scholarly research. A second type of master's degree is awarded for the completion of a professionally oriented program, for example, an M.Ed. in education, an M.B.A. in business administration, an M.F.A. in fine arts, an M.M. in music, an M.S.W. in social work, and an M.P.A. in public administration. A third type of master's degree is awarded in professional fields for study beyond the first-professional degree, for example, the Master of Laws (LL.M.) and Master of Science in various medical specializations.

Mathematics: A group of instructional programs that describes the science of logical symbolic language and its application.

Metropolitan population: The population residing in Metropolitan Statistical Areas (MSA's). See *Metropolitan Statistical Area*.

Metropolitan Statistical Area (MSA): A large population nucleus and the nearby communities which have a high degree of economic and social integration with that nucleus. Each MSA consists of one or more entire counties (or county equivalents) that meet specified standards pertaining to population, commuting ties, and metropolitan character. In New England, towns and cities, rather than counties, are the basic units. MSA's are designated by the Office of Management and Budget. An MSA includes a city and, generally, its entire urban area and the remainder of the county or counties in which the urban area is located. A MSA also includes such additional outlying counties which meet specified criteria relating to metropolitan character and level of commuting of workers into the central city or counties. Specified criteria governing the definition of MSA's recognized before 1980 are published in *Standard Metropolitan Statistical Areas: 1975*, issued by the Office of Management and Budget.

New MSA's were designated when 1980 counts showed that they met one or both of the following criteria:

1. Included a city with a population of at least 50,000 within their corporate limits, or
2. Included a Census Bureau-defined urbanized area (which must have a population of at least 50,000) and a total MSA population of at least 100,000 (or, in New England, 75,000).

Minimum-competency testing: Measuring the acquisition of competence or skills to or beyond a certain specified standard.

Nonmetropolitan residence group: The population residing outside Metropolitan Statistical Areas. See *Metropolitan Statistical Area*.

Nonresident alien: A person who is not a citizen of the United States and who is in this country on a temporary basis and does not have the right to remain indefinitely.

Nonsupervisory instructional staff: Persons such as curriculum specialists, counselors, librarians, remedial specialists, and others possessing education certification but not responsible for day-to-day teaching of the same group of pupils.

Orientation (private school): The group or groups, if any, with which a private elementary/secondary school is affiliated, or from which it derives subsidy or support.

> **Catholic school**: A private school over which a Roman Catholic church group exercises some control or provides some form of subsidy. Catholic schools for the most part include those operated or supported by: a parish, a group of parishes, a diocese, or a Catholic religious order.
>
> **Other religious school**: A private school affiliated with an organized religion or denomination other than Roman Catholicism or which has a religious orientation other than Catholic in its operation and curriculum.
>
> **Nonsectarian school**: A private school whose curriculum and operation are independent of religious orientation and influence in all but incidental ways.

Part-time enrollment: The number of students enrolled in higher education courses with a total credit load less the 75 percent of the normal full-time credit load.

Personal income: Current income received by persons from all sources minus their personal contributions for social insurance. Classified as "persons" are individuals (including owners of unincorporated firms), nonprofit institutions serving individuals, private trust funds, and private noninsured welfare funds. Personal income includes transfers (payments not resulting from current production) from government and business such as social security benefits, military pensions, etc., but excludes transfers among persons.

Physical and biological sciences: Physical sciences are instructional programs that describe inanimate objects, processes, or matter, energy, and associated phenomena. Biological sciences are instructional programs that describe the systematic study of living organisms (See also Science).

Postsecondary education: The provision of formal instructional programs with a curriculum designed primarily for students who have completed the requirements for a high school diploma or equivalent. This includes programs of an academic, vocational, and continuing professional education purpose, and excludes a vocational and adult basic education programs.

Private school or institution: A school or institution which is controlled by an individual or agency other than a State, a subdivision of a State, or the Federal government, which is usually supported primarily by other than public funds, and the operation of whose program rests with other than publicly elected or appointed officials.

Proprietary institution: An educational institution that is under private control but whose profits derive from revenues subject to taxation.

Public school or institution: A school or institution controlled and operated by publicly elected or appointed officials and deriving its primary support from public funds.

Pupil-teacher ratio: The enrollment of pupils at a given period of time, divided by the full-time-equivalent number of classroom teachers serving these pupils during the same period.

Racial/ethnic group: Classification indicating general racial or ethnic heritage based on self-identification, as in data collected by the Bureau of the Census or on observer identification, as in data collected by the Office for Civil Rights. These categories are in accordance with the Office of Management and Budget standard classification scheme presented below:

> **White**: A person having origins in any of the original peoples of Europe, North Africa, or the Middle East. Normally excludes persons of Hispanic origin except for tabulations produced by the Bureau of the Census, which are noted accordingly in this volume.
>
> **Black**: A person having origins in any of the black racial groups in Africa. Normally excludes persons of Hispanic origin except for tabulations produced by the Bureau of the Census, which are noted accordingly in this volume.
>
> **Hispanic**: A person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.
>
> **Asian or Pacific Islander**: A person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands. This area includes, for example, China, India, Japan, Korea, the Philippine Islands, and Samoa.
>
> **American Indian or Alaskan Native**: A person having origins in any of the original peoples of North America and maintaining cultural identification through tribal affiliation or community recognition.

Revenues: All funds received from external sources, net of refunds, and correcting transactions. Noncash transactions such as receipt of services, commodities, or other receipts "in kind" are excluded as are funds received from the issuance of debt, liquidation of investments, and nonroutine sale of property.

Salary: The total amount regularly paid or stipulated to be paid to an individual, before deductions, for personal services rendered while on the payroll of a business or organization.

Scholarships and fellowships: This category of college expenditures applies only to money given in the form of outright grants and trainee stipends to individuals enrolled in formal coursework, either for credit or not. Aid to students in the form of tuition or fee remissions is included. College Work Study funds are excluded and are reported under the program in which the student is working. In the tabulations in this volume, Pell Grants are not included in this expenditure category.

Scholastic Aptitude Test (SAT): An examination administered by the Educational Testing Service and used to predict the facility with which an individual will progress in learning college-level academic subjects.

School climate: The social system and culture of the school, including the organizational structure of the school and values and expectations within it.

School district: An education agency at the local level that exists primarily to operate public schools or to contract for public school services. Synonyms are "local basic administrative unit" and "local education agency."

School year: The 12-month period of time denoting the beginning and ending dates for school accounting purposes, usually from July 1 through June 30.

Science: The body of related courses concerned with knowledge of the physical and biological world and with the processes of discovering and validating this knowledge.

Secondary school: A school comprising any span of grades beginning with the next grade following an elementary or middle-school (usually 7, 8, or 9) and ending with or below grade 12. Both junior high schools and senior high schools are included.

Senior high school: A secondary school offering the final years of high school work necessary for graduation and invariably preceded by a junior high school.

Social studies: A group of instructional programs that describes the substantive portions of behavior, past and present activities, interactions, and organizations of people associated together for religious, benevolent, cultural, scientific, political, patriotic, or other purposes.

Staff assignments, elementary and secondary school:

> **District administrators**—The chief executive officers of education agencies (such as superintendents and deputies) and all others with district-wide responsibility. Such positions may be business managers, administrative assistants, coordinators and the like.

District administrative support staff—Those personnel that are assigned to the staffs of the district administrators. They may be clerks, computers programmers and others concerned with the functioning of the entire district.

Guidance counselors—Professional staff whose activities involve counseling with students and parents, consulting with other staff members on learning problems, evaluating the abilities of students, assisting students in personal and social development, providing referral assistance, and working with other staff members in planning and conducting guidance programs for students.

Instructional (teacher) aides—Those staff members assigned to assist a teacher with routine activities associated with teaching (i.e., those activities requiring minor decisions regarding students, such as monitoring, conducting rote exercises, operating equipment, and clerking). Volunteer aides are not included in this category.

Librarians—Staff members assigned to perform professional library service activities such as selecting, acquiring, preparing, cataloging, and circulating books and other printed materials; planning the use of the library by students, teachers and other members of the instructional staff; and guiding individuals in their use of library books and materials, which are maintained separately or as part of an instructional materials center.

Other support services staff—All staff not reported in other categories. This group includes media personnel, social workers, data processors, health maintenance workers, bus drivers, security cafeteria workers, and other staff.

School administrators—Those staff members whose activities are concerned with directing and managing the operation of a particular school. They may be principals or assistant principals, including those who coordinate school instructional activities with those of the local education agency (LEA) and other appropriate units.

Trade and industrial occupations: The branch of vocational education which is concerned with preparing persons for initial employment or with updating or retraining workers in a wide range of trade and industrial occupations. Such occupations are skilled or semiskilled and are concerned with layout designing, producing, processing, assembling, testing, maintaining, servicing, or repairing any product or commodity.

Tuition and fees: A payment or charge for instruction or compensation for services, privileges, or the use of equipment, books, or other goods.

Undergraduate students: Students registered at an institution of higher education who are working in a program leading to a baccalaureate degree or other formal award below the baccalaureate such as an associate degree.

University: An institution of higher education consisting of a liberal arts college, a diverse graduate program, and usually two or more professional schools or faculties and empowered to confer degrees in various fields of study.

Visual and performing arts: A group of instructional programs that generally describes the historic development, aesthetic qualities, and creative processes of two or more of the visual and performing arts.

Vocational education: Organized educational programs, services, and activities which are directly related to the preparation of individuals for paid or unpaid employment, or for additional preparation for a career, requiring other than a baccalaureate or advanced degree.

Vocational home economics: Vocational courses of instruction emphasizing the acquisition of competencies needed for getting and holding a job or preparing for advancement in an occupational area using home economics knowledge or skills.

Year-round, full-time worker: One who worked primarily at full-time civilian jobs for 50 weeks or more during the preceding calendar year.

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